PUBLIC TELECOMMUNICATIONS

by

Harry Minor

MSW, Brandeis University
1972

AB, University of Detroit
1969

SUBMITTED IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE DEGREE OF

MASTER OF CITY PLANNING

of the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

May 1975

Signature of Author _____
Department of Urban Studies and Planning

Certified by _____
Thesis Supervisor

Accepted by _____
Chairman, Departmental Committee on Graduate Students

Abstract

Public Telecommunications

By: Harry Minor

Submitted in Partial Fulfillment of the Requirements for the Degree of Master of City Planning of the Massachusetts Institute of Technology

June 1975

Broadcasting was a genuine innovation. There was nothing to indicate how it should be financed or organized. At that time neither advertising or networking existed. The law, such as it was, had its basis in maritime communications where radio had successfully taken over the job of the pigeon.

Broadcasting has a special social responsiblilty, not quite like that of any other medium. This responsibility is implied in the law, which states that the public interest is best fulfilled by local community self-expression and diversity in programming. These goals predate television insofar as they come from the days of radio.

Cable television could insure both program diversity and local community self-expression but it is not a genuine innovation. It is an adaptation of a technology to meet certain specialized needs. These are of particular importance to minority communities but they will not be fulfilled unless cable communications can unlock itself from an either or battle with the broadcast interests and the Federal Communications Commission.

Thesis Supervisor: Bennett Harrison

Title: Associate Professor of Economics and Urban Studies and Planning

TABLE OF CONTENTS

TABLE OF CONTENTS - cont'd.

LIST OF TABLES

LIST OF TABLES

FOREWORD

It has been suggested by three of the leading black cable experts (Charles Tate, Bill Wright, Ted Ledbetter) that cable-communications is a vehicle inherently capable of reconstructing southern black communities through black colleges. This paper grows out of that idea. It attempts to do three things:

1) to look at the development of cablecommunications in the context of the development of broadcasting, cable's direct antecedent;

2) to explain why a black college-based system of interconnection might be a possible reality.

3) to push rather analytically at the economics of cable and particularly its much heralded employment opportunities.

THE TECHNOLOGY

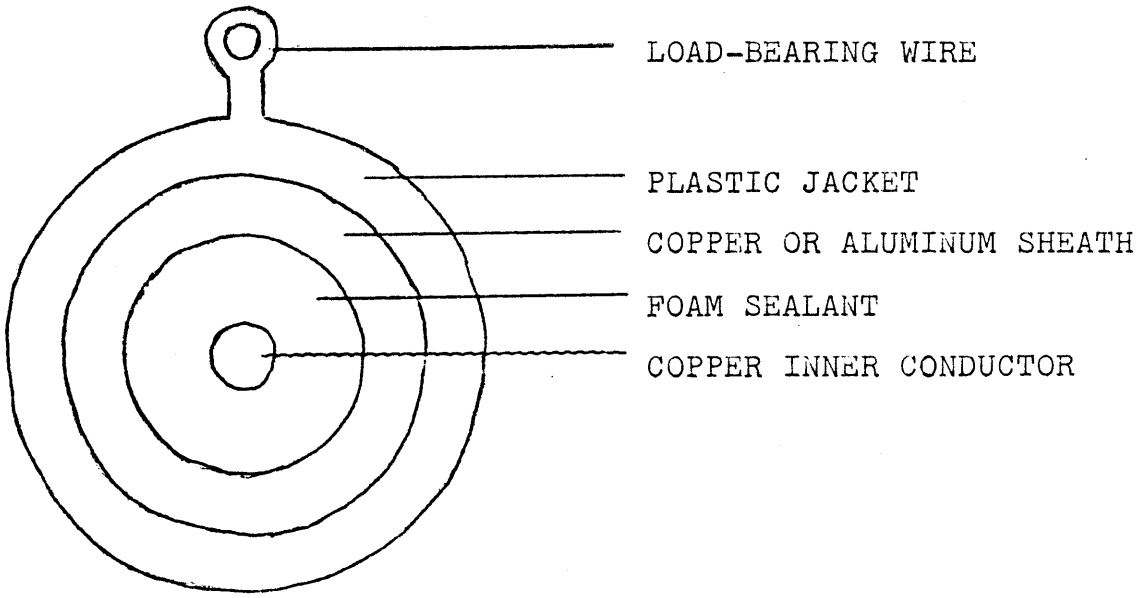
I would like to review the conditions under which broadcasting began, because in a sense one cannot really decide whether this dream of a black cable network is outlandish unless one clearly understands the relevant precedents. Firstly, broadcasting was a genuine innovation. There was nothing to indicate how it should be financed or organized. Neither advertising (the sale of time to sponsors) nor networking (the syndication of programs) existed. Secondly, the law,such as it was, had its basis in maritime communications where radio had successfully taken over the job of the pigeon. There is no way at all (not even if David Sarnoff had written the law himself) for a 1922 law to have anticipated the phenomenon of broadcasting. Thirdly, it should be noted that the principle communications companies all became active in broadcasting in the first two years.

Cable television (see Appendix 1, The Definition of a Cable Television System) is not a genuine innovation. It is an adaptation of a previous technology to fit certain specified objectives.

The primary element in a basic cable television system is a coaxial cable (see Diagram 1:01). It was developed by Bell Laboratories in the late 1930's and was used for military communications during World War II. After the first cable systemswere built in eastern Pennsylvania and Oregon in 1949, engineers began to refine and improve the coaxial cable and increase its channel capacity.

The coaxial cable is composed of a copper wire, the inner conductor surrounded by plastic foam which separates the inner conductor from a thin web of knitted aluminum which serves as the outer conductor. This is wrapped in a black plastic sheath to

DIAGRAM 1:01



COAXIAL CABLE used in cable television system typically has four layers. The main cables are about three-quarters of an inch in diameter; the cables into the home, less than half an inch. In most systems the cable is suspended in utility conduits or on utility poles.

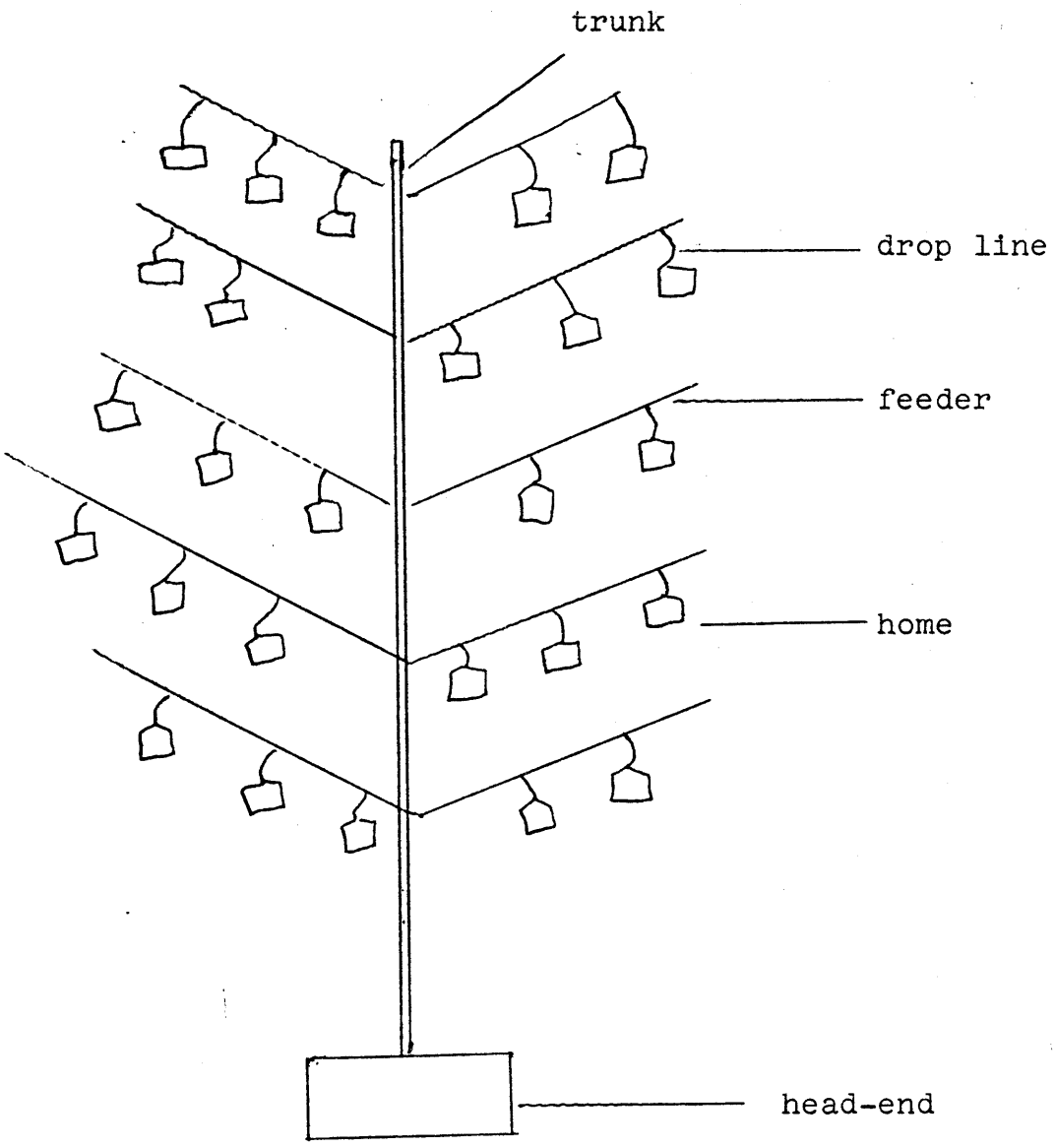
protect the cable from weather. The coaxial can carry all frequencies between 40 million and 300 million cycles per second. In contrast, the standard television signal carries only 6 million cycles per second. In principle, the cable can carry a maximum of forty channels.

A single coaxial cable has about 50,000 times the message carrying capacity of a pair of telephone wires. It can carry from 20 to 35 channels of television, plus the AM and FM radio bands and a substantial amount of non-visual electronic messages. This greater capacity of coaxial wire is a direct result of its superior design. The wire is shielded (360 degrees) against noise and the arrangement of the signal wires virtually eliminates cross-talk (noise between adjacent wires) which is the principle limiting factor in stacking wires together. Thus, in a coaxial wire we have an insulated, compact, and efficient package for a large number of functions.

The second component of the cable system (CTV) is a link between the source of the signal called the "head-end" and each subscriber. From the head-end a trunk line runs out through the area to be covered. Feeder lines extend out from the trunk line and are attached to each subscriber's residence like a telephone wire. In this manner, each subscriber is physically linked to the head-end (see Diagram 1:02)

The third component, an amplifier, is required because of the nature of electrical energy. An electrical signal loses strength as it passes along a wire. To compensate for this loss in strength, amplifiers are placed along the line.

DIAGRAM 1:02



SCHEMATIC DIAGRAM OF A TYPICAL CABLE TELEVISION SYSTEM

The fourth component is the television signal which is fed into the system (through signals received at the head-end) and passed along. Programs are provided in three ways: (1) by erecting a master antenna which picks up signals from over-the-air broadcasters and transmits them through the system; (2) by erecting an antenna close to the signal source (if a more distant signal is desired) and transmitting these signals via a long-distant microwave or cable line (communications satellites add new range to the transmission of CTV signals - see Diagram 1:03); (3) the last way of providing programs consists of constructing television studios for local origination (i.e., original production).

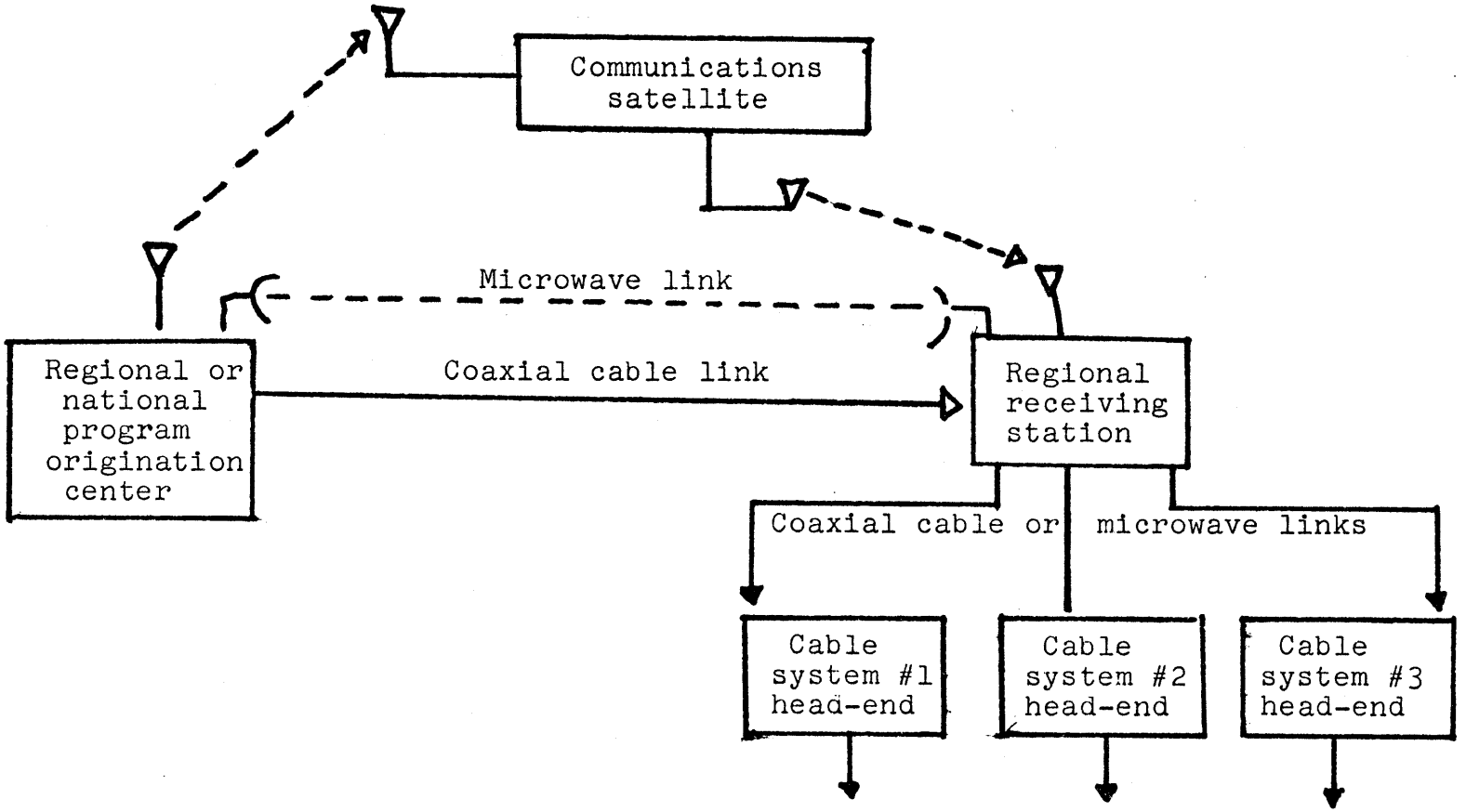
Origin

Cable television differs in the method of transmitting television signals (via a wire instead of the conventional over-the-air broadcasting method). First developed in rural areas, cable television gained substantial penetration because of its ability to produce a clearer reception and more diverse programming than competing local broadcast television stations.

CTV was originally,and to a great extent still is, simply a means for distributing broadcast signals from a point of more advantageous antenna reception for over-the-air signals that can be received through a standard antenna.

In the late 1940's, Robert J. Tarlton had difficulty selling television sets due to poor program reception in Lansford, Pennsylvania. Tarlton, who served as a communications technician

DIAGRAM 1:03



REGIONAL OR NATIONAL PROGRAM NETWORK

during World War II and worked with the coaxial cable, formed a corporation called the Panther Valley Television Company to build a master antenna atop a mountain in Lansford to receive television signals from Philadelphia, sixty-five miles away. The signals were fed into an amplifier and then into a coaxial cable strung on poles down the mountainside and into subscribers' homes. In a short period of time, Tarlton was selling television sets and the cable television industry was off to a small but important start.

Cable TV (like electric power and telephone service) developed first in places where the population was sufficiently dense enough to cover all expected capital costs. For the industry, capital investment in the pole lines requires to distribute cable television needs on the average of a minimum 35 users per mile. This is the same kind of per mile user density that was required for the initial distribution of electric power or telephone service.

Cable TV began with small enterprises in communities with poor reception. These companies gained financial stability primarily through a user fee charged to subscribers willing to pay a modest fee for better signal quality and greater selection of programs. The relatively low operating cost incurred by retransmitting signals generated a fairly high return on investment. Accelerated depreciation schedules enabled the cable operators to gain tax benefits while increasing the book value of their investment and new CTV installations increase the system's revenues.

History of Regulation

Contrary to the Federal Radio Commission's position at the time broadcasting began, the Federal Communications Commission has as a tradition of regulation been looking at cable television for more than 27 years. The first time was in Oregon in 1948. The Commission viewed Cable TV as a good thing because it extended broadcast television signals into areas with poor reception. That view remained constant until the middle fifties when TV broadcasters started complaining that citizens in their broadcast areas were getting more signals then the advertising revenues could really support. A broadcast television station makes a profit by bringing in revenues from advertisers in excess of their programming and operational costs. The broadcasters' rate for advertisers is a function of the number of substantiated (usually by Neilsen) viewers. The more stations operating (or signals received) the greater the potential fragmentation of the market. At this point, what the broadcasters were saying was that because of the number of signals being received, their individual viewerships were not allowing them to make their expected profit. The real issue, however, was that the signals were being brought in from outside areas and the local broadcasters did not like the competition. The FCC at first said that it did not have jurisdiction, then changed its mind and said it did. Based on the motivation for both the radio act of '27 and the subsequent revision of '34, I believe that the FCC is unauthorized in the case of Cable TV.

Regulations were initiated to protect broadcasters in small towns of Wyoming and Montana -- where there was a very limited audience and where a great many signals were being brought in from outside areas. The FCC got particularly concerned when Los Angeles signals were being brought into the Southwest by microwave. This was the initial focus of

FCC regulations, i.e., to assure that people continued to have over-the-air television broadcast service and that all the service was not converted to cable television service so that people would not have to apply for a service that they formerly got for free.

As time went on, the Commission became less concerned with the small television stations and more concerned with the independent UHF broadcasters in larger markets because at this time few people had UHF television receivers and those stations were particularly vulnerable to the additional competition which cable television represented. The FCC shifted its regulatory posture from the small television stations in Montana and Wyoming and started protecting the UHF broadcasters in the larger cities. Upon further study, considerable economic evidence was accumulated and it appeared that TV stations did not need all the protection the FCC was giving them and so they eased off some of the regulations for Cable television.

The approach of the FCC is unchanged today and its most recent regulation only in effect for two years underlines this strategy which is essentially conservative of broadcast interests. The FCC does not unambiguously promote cable television. What the FCC does do is permit cable television to get enough broadcast signals so that they will be able to operate but not enough so that the local over-the-air broadcasters will go out of business.

The rules adopted in February of 1972 profess to accomplish this and provide some services to people in the cable television areas also. The regulations vary a little bit according to where you are in the country.

In the top 100 markets (see Table 1:04), the FCC requires every new cable system going into operation to have twice as many channels for use as there are broadcast signals distributed. If there were thirteen broadcast TV signals currently received , the cable system would have to operate 26 channels (see Table 1:05).

TABLE 1:04A

TOP 50 BLACK TV MARKETS

Rank	City	Black Population (city only) 1970 U.S. Census Total Blacks	%	TV Market Rank Total Metro Area (FCC) Rank	1) Number of Cable subscribers in the City, 1972	2) Number of Franchised and/or Operating Systems
1	New York	1,666,636	21.2	1	100,500	4
2	Chicago	1,102,620	32.7	3	0	0
3	Detroit	660,428	43.7	5	0	0
4	Philadelphia	653,791	33.6	4	100	6
5	Washington D.C.	537,712	71.1	9	0	0
6	Los Angeles	503,606	17.9	2	40,000	3
7	Baltimore	420,210	46.4	14	0	0
8	Houston	316,992	38.9	15	0	1
9	Cleveland	287,841	38.3	8	0	0
10	New Orleans	267,308	45.0	31	0	0
11	Atlanta	255,051	51.3	18	3,500	1
12	St. Louis	254,191	40.9	11	0	1
13	Memphis	242,513	38.9	26	0	1
14	Dallas	210,238	24.9	12	0	0
15	Newark	207,458	54.2	See N.Y.	6	1
16	Indianapolis	134,320	18.0	16	0	0
17	Birmingham	126,338	42.0	40	0	0
18	Cincinnati	125,070	27.6	17	0	0
19	Oakland	124,710	34.5	See San Fran.	51	1
20	Jacksonville	118,158	22.3	68	0	0
21	Kansas City (Mo)	112,005	22.1	ss	0	0

1) Source: Television Factbook: Service Volume, 1973

2) Because a city has one or more franchised systems, this does not necessarily mean the entire city has been franchised.

Rank	City	Black Population (city only 1970 U. S. Census Total Blacks	%	TV Market Rank Total Metro Area (FCC) Rank	Number of Cable subscribers in the City, 1972	Number of Franchised and/or Operating Systems
22	Milwaukee	105,088	14.7	23	0	0
23	Pittsburgh	104,904	20.2	10	0	0
24	Richmond (va)	104,766	42.0	64	0	0
25	Boston	104,707	16.3	6	0	0
26	Columbus (O)	99,627	18.5	27	60	4
27	San Francisco	96,078	13.4	7	18,500	2
38	Buffalo	94,329	20.4	24	2,000	1
39	Gary	92,695	52.8	See Chicago		2
30	Nashville	87,851	19.6	30	0	1
31	Norfolk	87,261	28.3	43	0	2
32	Louisville	86,040	32.8	38	0	0
33	Fort Worth	78,324	19.9	See Dallas	0	0
34	Miami	76,156	22.7	21	0	0
35	Dayton	74,284	30.5	41	0	0
36	Charlotte	72,972	30.3	42	14,000	2
37	Mobile	67,356	35.4	60	4,000	1
38	Shreveport	62,162	34.1	59	0	1
39	Jackson	61,063	39.7	76	0	1
40	Compton (Ca)	55,781	71.0	See L.A.	0	0
41	Tampa	54,720	19.7	27	0	0
42	Jersey City	54,595	21.0	See N.Y.	0	0
43	Flint	54,237	28.1	62	14,000	2
44	Savannah	53,111	44.9	151	7,000	1
45	San Diego	52,961	7.6	52	71,000	5
46	Toledo	52,915	13.8	53	19,000	2
47	Oklahoma City	50,103	13.7	39	0	0
48	San Antonio	50,041	7.6	43	0	1
49	Rochester	49,647	16.8	57	750	1
50	East St. Louis	48,368	69.1	See St. Louis	0	0

TABLE 1:04B

TOP SPANISH TV MARKETS

Rank	City	Total Spanish Population in SMSA (Census 1970)	TV Market Rank Total Metro Area	Number of Cable Subscribers in the City, 1972	Number of Franchised and/or Operating Systems in the City
1	Los Angeles	1,289,000	2	40,000	3
2	New York	846,000	1	100,500	4
3	San Antonio	385,000	45	0	1
4	San Francisco	364,000	7	18,500	2
5	Chicago	327,000	3	0	0
6	Miami	299,000	21	0	0
7	Houston	212,000	15	0	1
8	El Paso	204,000	113	0	1
9	San Bernardino/ Riverside	189,000	See L.A.	24,000	2
10	San Jose	187,000	See San. Fran.	19,000	1
11	San Diego	174,000	51	71,000	5
12	Anaheim/ Santa Ana	160,00	See L.A.	0	0
13	McAllen, Texas	144,000	151	2,000	1
14	Phoenix	141,000	43	0	0
15	Denver	139,000	32	0	0
16	Corpus Cristi	127,000	(130)	0	1
17	Alberquerque	124,000	81	0	1
18	Brownsville	107,000	(151)	1,000	1

SOURCE: Television Factbook: Service Volume, 1973.

Rank	City	Total Spanish Population in SMSA (Census 1970)	TV Market Rank Total Metro Area	Number of Cable subscribers in the City, 1972	Number of Franchised and/or Operating Systems in the City
19	Fresno	104,000	72	0	1
20	Dallas	101,000	12	0	0
21	Tucson	83,000	(101)	0	0
22	Sacramento	81,000	25	0	0
23	Oxnard-Ventura	74,000	See L.A.	5,000	1
24	Washington D.C.	71,000	9	0	0
25	Laredo	62,000	(201)	11,000	1
26	Tampa/ St. Petersburg	58,000	28	200	1
27	Detroit	56,000	5	0	0
28	Bakers Field	55,000	(149)	36,000	2
29	Salinas/ Monterey	53,000	(102)	12,000	1

TABLE 1:05

CHANNEL CAPACITY
OF EXISTING CTV
SYSTEMS

# of Channels	# of CTV Systems
Over 20	207
13-20	262
6-12	2,181
5 only	287
Sub-5	49
Not available	46
	3,032

Two-Way

Systems operating	63
Systems planning	153

SOURCE: Television Fact Book, 1974 (3,032 Systems operating, June '73)

The FCC further specifies certain uses for these channels. One channel must be available to local educational authorities, free; one channel is available to local government, free; and one channel is available to the public -- it is called the public access channel. It is intended that this channel be available on a first-come-first-serve basis (non-discriminatory) largely free from any control by the cable operators. It is a sort of a soap-box, "Hyde Park" idea, and anybody who wants can say anything on any subject at any time (subject to very limited legal restrictions). The additional channels that are left over must be available for lease to anybody who wants to use them. If one wants to put on a program on a commercial basis or a subscription or any other way he is entitled to lease a channel. Those channels beyond the three that have been designated are mostly used by the cable operators.

The planning role that the FCC is exercising now is to control the uses that are made of the cable channels. Though the FCC has some standards which govern the franchise process -- the selection of the particular operator is really determined at the local level (see discussion on franchise authority). The franchise can only be given out after a public proceeding. Local regulations must assure that cable service is extended equitably and reasonably to the whole area: the franchise is granted for a maximum of 15 years. So there is a chance to "throw the bums out" if they do not do a good job.

These guidelines are based on an explicit FCC policy to integrate cable television into the national network structure to insure maximum television service to all areas. The role of cable was seen as a supplementary service that would not unduly impede or damage the growth of the television broadcast industry.

Specifically, the First Report and Order, issued in 1965 by the FCC, basically outlined what are referred to as the carriage and non-duplication rules. The carriage rule requires that a CTV system must carry local television station programming in addition to any other programs and stations it may carry. The non-duplication rule prohibits the cable operator from showing programs on the same day that the VHF stations show them. Questions of economic protectionism and control of television content are generated by this non-duplication rule.

In 1966, the FCC released the Second Report and Order which prevented many CTV systems operating in urban areas from importing distant signals, thereby depriving cable of one of its principle selling points. The distant signal rule states that if any established or potential television station in the cable system's market area objects to the CTV's plan to import distant signals, the cable system cannot import unless it receives FCC approval.

FCC officials at all levels are aware that they do not really know how to optimize the growth of cable to capture its benefits while limiting its social costs. The main criticism of the FCC's calculus is its sense that the public interest unifies the primacy of broadcast television industry as it presently exists.

Governments will have an important influence in deciding the direction of cable television's future. In developing public policy, one should look at CTV not merely from its past and present cababilities but also with an eye to any future benefits of cable. Whether these benefits are realized will depend, in large measure, on the actions or non-actions of government.

Beyond the regulatory problems encountered by CTV systems are other obstacles it must overcome to realize its full potential. Some obstacles come in the form of competition from major information and entertainment corporations as well as the telephone company. Another obstacle is related to the growth of the cable industry itself.

The cable industry is not yet totally controlled by a concentration of national power that has made substantive change in broadcasting close to impossible (see Table 1:0[6]).

TABLE 1:0[6]

PATTERN OF BROADCAST SYSTEMS OWNERSHIP - 1923

Category	%
Communications manufacturers and dealers	39
Educational institutions	12
Publishers	12
Department stores	5
Religious institutions	2
Other	30

SOURCE: Commercial Broadcasting Pioneer, Wm. Banning, Harvard University Press, Cambridge, 1946

It should also be noted that, unlike the successful pattern of broadcasting, in cable the principle communications companies were slow to become actively involved in the first few years (see Table 1:07). This slowness among corporate investors exists even today.

TABLE 1:07

PATTERN OF CTV SYSTEMS OWNERSHIP - 1973

Category	%
Broadcaster	34.6
Newspaper	10.2
Publisher	7.3
Program Producer	19.9
Theater	4.3
Telephone	1.6
Community or Subscriber	2.5
Manufacturer	10.6

SOURCE: Television Fact Book, 1974 (3,032 systems operating, June '73)

One example of a principle communications monopoly wishing to "guide" the development of cable television is the case of the American Telephone and Telegraph. For many years, CTV, with a greater communication-carrying capacity than telephone wire, has been seeking the same access to each home.

The possibility of AT&T's enroachment in the CTV area was diminished by a Federal Communications Commission (FCC) regulation which prohibited telephone companies from operating cable systems in areas where they provide telephone service and permitted independent cable operators to lease from the telephone company poles to string the cable wire on. Besides standard phone service, special types

of electronic information transmission systems now in service (e.g., MCI, Datran) are threatened by cable.

The fears expressed by the FCC and other state regulatory agencies regarding the impact of the growth of CTV on the broadcast television industry are based on old assumptions (see Table 1:08) that have never been adequately examined. I continue to be reminded of the current AT&T battle with the Justice Department who initiated a rather comprehensive study of the AT&T rate structure only to fold it up from the sheer weight of the data. Broadcast television, an industry which makes its programming decisions for 200 million people on the basis of relatively few, centric, individual has managed very effectively to manipulate the FCC on the strength of even less data.

It is reasonable to expect that the television viewer would be able to enjoy as much of "free" television as he does now; at the same time, the cable subscriber would have options, with additional fees, of viewing programming not available through local over-the-air broadcasting in his area. In principle, television could evolve into a medium with a range of public choice more closely resembling the book and magazine industries (see Tables 1:08 and 1:09).

TABLE 1:0[8]

THE SIZE AND GROWTH OF THE CTV INDUSTRY IN THE U.S.

1952 - 1973

Years (as of Jan. 1)	Systems	Subscribers	Annual Percentages Increase in Subscribers
1952	70	14,000	---
1953	150	30,000	114.0
1954	300	65,000	116.0
1955	400	150,000	131.0
1956	450	300,000	100.0
1957	500	350,000	16.5
1958	525	450,000	28.5
1959	560	550,000	24.0
1960	640	650,000	18.0
1961	700	725,000	11.5
1962	800	850,000	17.2
1963	1,000	950,000	11.7
1964	1,200	1,085,000	14.2
1965	1,325	1,275,000	17.4
1966	1,570	1,575,000	23.5
1967	1,770	2,100,000	33.2
1968	2,000	2,000,000	33.0
1969	2,260	3,600,000	28.5
1970	2,490	4,500,000	25.0
1971	2,640	5,300,000	17.7
1972	2,841	6,000,000	13.2
1973	2,991	7,300,000	21.6

SOURCE: Television Fact Book, 1974
(3,032 Systems operating, June '73)

TABLE 1:09

U.S. CATV SYSTEMS
BY SUBSCRIBER SIZE

Size by Subscribers	Systems
20,000 & over	31
10,000-19,999	119
5,000-9,999	252
3,500-4,999	176
2,000-3,499	417
1,000-1,999	545
500-999	587
50-499	810
49 and under	42
Not Available	53
Total	3,032

SOURCE: Television Fact Book, 1974
(3,032 Systems operating, June '73)

Networks

Why the emphasis on networks? Because they represent an important way of lowering unit cost. There are at least two different meanings for the word networking. In the larger sense, networks do not really show (i.e., broadcast) programs. Networking is the ability to provide the same program simultaneously to a large number of systems. From a narrower point of view, a network is a series of interconnected stations which receive programs (generally on AT&T long lines) simultaneously, though each has the option of taping the network feed and rebroadcasting it at a later time.

The interconnection and networking of cable systems has not been a major consideration until recently. Rural CATV systems providing only commercial TV programs had little, if any, need for interconnection. For large major-market systems furnishing a variety of new services, however, interconnection or networking become much more important.

If one spent a considerable amount of money preparing a program suitable for a local origination channel and if this program could be used by all of the operators's systems, the economic benefits (scale economies) would be attractive.[2]

Black Colleges as the Framework for a CTV Network

There are several plausible reasons why one would suggest that a cable network be constructed based on a consortium of Black colleges:

1) The Black Colleges need a financial boost quickly;

2) Several more likely cable developers just are not going to develop a cable network;

3) If Blacks are ever going to have a significant role in communications, it will be through cable or not at all;

4) It could make a substantive change in the relative isolation of minority communities;

5) A Black College-based group could cable many of the urban areas in the North more cheaply;

6) Job creation and skill development;

7) There is a natural yet unachieved relationship to the Public Broadcasting System and the Black Colleges could exploit that more easily than others;

8) There is a similar vacuum in the UHF system of stations and an outside group (especially one who would be a source of programming) could add much needed stability.

1. The Black Colleges need a financial boost quickly

Black colleges typically lack wealthy alumni and have limited endowments. Because more than 60 percent of the students who attend come from families who earn less than $5,000 per year.[3] Black Colleges have to charge lower tuition and minimal student fees.

At a time when (according to the Carnegie Commission) private education is in a serious financial crunch, the position of Black Colleges is especially fragile.

As if that were not enough, Dr. Thomas Sowell,[4] states that:

> No Black College has a department ranking among graduate departments in any of the twenty-nine fields surveyed by the American Council of Education. None ranks among the "selective" institutions with regard to student admissions. None has a student body whose College Board scores are within 100 points of any school in the Ivy League. None has a library with even one-third as many volumes as the library of the University of Texas, much less the much larger libraries at such schools as Harvard, Yale, or Princeton. Many black schools are so small that a number of predominantly white institutions graduate more black students annually than they do and studies have found black colleges and universities as deficient in spirit as they are in academic matters. To make matters worse, within the past decade, black colleges and universities have been losing their best-qualified faculty and their best potential students to white institutions.

Collective ownership of a cable network could allow the colleges to get a broader range of financial support (subscription fees) while offering something in return (additional programming). It could also be a way of assuring a flow of money more independent than the public charity approach currently used.

2. Several more likely cable developers just are not going to do it

It is not fair to examine the subject of a Black College-based system in the abstract. The benefits and costs of this kind of system have to be juxtaposed against other possible forms. The development of cable networks is a characteristically dynamic process. There exist exogenous influences and one can estimate the impacts of development only if there is to be a comparison with estimates for either a no development situation or a development alternative, i.e., it is probably unlikely that a status quo future with static cable delivery will occur.

Cable is coming but the cable industry has a current lack of organization with regard to suppliers and users of services. It must be financed by someone. According to a recent study[5] on cable by Arthur D. Little, Inc., the five most likely groups are not going to do it in its present institutional set-up.

a. One would expect the cable operators, using the broadband capacity of their cable systems, to provide initial installations of hardware which would make possible the provision of new cable services at least on a building-block basis. The cable industry is highly capital-intensive and, in addition, the profit-making potential of cable services is as yet untested. The cable operator continues to do the thing he knows best providing conventional broadcast services to the public.

b. The major hardware suppliers who would have much to gain from the national and international proliferation of new communication services (GTE/Sylvania, ITT, Magnavox, RCA, Hughes) are of the opinion that they are hardware-producing organizations and not providers of telecommunication services. These organizations look to others to buy the hardware from them to make these proposed additional services feasible.

This inability of cable suppliers to connect programming (and hence networking) to their self-interest is a clear reversal of the position taken in the 1920's by General Electric, Westinghouse and AT&T (including Western Electric). These three powerful companies seized upon broadcasting. In fairness, it should be noted that these same companies did not seize the telegraph immediately. This was probably due to a lag between science and technology. The inventors had jumped out in front of the existing marketing expertise.

Westinghouse underwrote the cost of the first commercially licensed standard broadcast station, KDKA, in Pittsburgh, Pa. in 1920.[6]

WEAF which developed the basic techniques of network broadcasting and commercial sponsorship was a product of AT&T.

c. The telephone common carriers are prohibited by FCC regulation from providing cable services in areas where they provide telephone services and, for the most part, are having a hard enough time merely keeping up with the increasing demand for current telephone and data transmission services.

d. Governments, municipal, state, and federal, each face ever increasing demands for funds to go into current program areas, especially with the presence of inflation and, therefore, find it difficult to become enthusiastic about developing a new program requiring additional significant funds.

e. The financial community which is generally interested in investing for profit and which is an extremely important group if new cable services are to be made available on a nation-wide basis, has not been presented with well-grounded proposals for investment in such systems.

At the same time, all five groups agree that the profit potential is there for cablecommunications in the future and that there is significant potential for improvement in urban living, in education, and in social environment. They are also convinced that these advancements will occur in the near future.

TABLE 1:10

LARGE CTV SYSTEMS IN THE SOUTH[1]

STATE CITY	SUBSCRIBERS
ALABAMA:	
Florence	16,700
Gadsden	11,339
Huntsville	19,200
Tuscaloosa	11,530
ARKANSAS:	
Ft. Smith	13,408
FLORIDA:	
Ft. Walton Beach	14,342
Melbourne	19,721
Naples	11,000
Pensacola	13,500
Sarasota	15,849
Tallahassee	13,500
Vero Beach	15,500
GEORGIA:	
DeKalb County	10,500
Macon	16,000
Rome	11,100
LOUISIANA:	
Alexandria	12,100
MARYLAND:	
Cumberland	19,884
Salisbury	10,850
MISSISSIPPI:	
Biloxi	10,700
NORTH CAROLINA:	
Charlotte	13,000
Fayetteville	16,607
Raleigh	13,500
Winston-Salem	10,118
TENNESSEE:	
Kingsport	11,500
VIRGINIA:	
Charlottesville	12,325

SOURCE: 1974, Cable Source Book

3. It will be through cable or not at all if blacks are ever going to have a significant role in communications

If one goal of public policy is to develop major minority enterprises in the new growth industries, cable would be on the list. The black role in other areas of communication is minimal. Radio is nearly 50 years old and there are only 32 black-owned stations. Commercial television is 25 years old and there is one licensed black-owned station (and it did not occur until 1973). Cable, after the FCC regulations of 1972, has seven black-owned franchises already and eleven probables. It is important for blacks and other minorities to get involved in cablecommunications at the outset. This was not done with radio or commercial television and, consequently, there is at most a nominal representation in the media at its mature state.

A confidential study by Arthur D. Little, Inc., for a major insurance company on the general performance of electromagnetic media, shows that the cable offers the most potential for long-run growth of any medium (see Table 1:11).

4. It could make a substantive change in the relative isolation of minority communities

Broadcasting is a mass institution. And, as such, it deals in program material adapted to the needs and interests of related numbers of people. Therefore, it is almost entirely at the service of the predominantly non-black middle-class population. The very method for financing broadcast television obliges it to ignore minority

TABLE 1:11

PERFORMANCE OF ELECTROMAGNETIC MEDIA

	Television			Radio	
	UHF	VHF	Cable	AM	FM
Financial Performance	Poor	Excellent	Good	Good	Poor
Price	Medium	High	High	Med-High	Low-Med
Mechanics of Entry					
-new construction	Yes	No	?	No	Yes
-purchase	Yes	Hard	Yes	Possible	Yes
-inimical takeover[6]	Yes	Hard	Yes	Yes	Yes
Future Development	Limited	Limited	Possible	Limited	Limited
Prospects	Limited	Limited	Excellent	Limited	Medium

SOURCE: Arthur D. Little, Report for Life Insurance Companies, 1973

groups, especially minority groups who are perceived as deficient in purchasing power. This necessarily contributes to the isolation of minority communities.

Cable television is a worthwhile enterprise to a community because of its role as a communications vehicle. Our values, attitudes and, to a large extent, actions, are derivatives of how we see things. From a solely informational point of view, black communities have suffered. This has resulted in a lack of job opportunities, household and product awareness, and legal rights. Perhaps, more importantly, blacks have suffered from a negative image which has succeeded in causing some not to venture forward at all and others at least to be skeptical about their chances for success. Related to this is a third factor -- the inability to bond cohesively as a group, thereby allowing outsiders to exploit alleged fragmentation. Fourthly, people pick up some of the images they follow from television and films (this seems to be especially true for young children) and both of these industries have fostered negative stereotypes of blacks. It is my feeling that while cable technology is a neutral mechanism as all technologies are, black ownership of cable systems offers communities the opportunity to reject negative influences while, at the same time, producing positive images. Local ownership also offers the hope of more accurate news reporting and a better informed citizenry is usually thought to be better able to handle community problems.

5. A black college-based group could cable many of the urban areas more cheaply

Cable television has not yet developed in the major urban markets. About half of the major cities have not even granted cable franchises. Though the FCC sets guidelines concerning the public interested, the individual states have the power to decide how franchises will be issued. The FCC gave this power to issue a franchise back to the states. Originally, the states had the power to approve broadcast decisions. There were constant violations complicated by the fact that once a broadcast signal is airborne, one cannot make it stop at a state line or prevent receivers from picking that signal up, hence federal regulation of broadcast. It is significant that it was the explicit request of the broadcasters themselves for governmental help which initiated the supervision. Fifty years later when the motion picture industry was faced with impending governmental supervision, they decided to set up a quasi-regulatory board of their own. Wire (point to point) like the telephone is state regulated. Cable TV is an exception and the reason is that the broadcasters want to keep it under their control. The state legislatures set local conditions. In all but one State (Connecticut) local jurisdictions issue franchises and, as such, they are allowed to add on their own special priorities as conditions for awarding franchises so long as they remain inside the overall FCC objectives. Even in those cities where franchises have been granted, minority cable opportunities are not foreclosed.

Additional cable franchises can and are being granted in certain cities. In fact, three cities that have minority-owned cable were granted their franchises subsequent to the cities having made initial grants to non-minority companies.

There are two major kinds of expenses associated with new cable systems: the actual system development expense and the real cost of obtaining a franchise.

One of the central difficulties that the larger corporations have had in developing cable in urban areas is the anti-colonial attitude of ethnic and minority groups to any kind of foreign investment. While it is true that the urban areas have the highest densities and offer potentially higher profits, they also possess these cadres of community folks who are well skilled in the art of urban politics, having fought highways and urban renewal and more than willing to fight absentee cable ownership.

It is patently ridiculous to think that a subscriber-based auxiliary system such as cable could be successful without strong black participation given the present posture of black communities. On 4 December 1972, Cox Cable Communications found this fact out when they had to make significant concessions (one million dollars) to a minority group in California (the Third World Coalition) in order to have the group support their attempted merger with American Television and Communications.

A consortium of colleges in a cooperative arrangement (perhaps even using Community Development Corporations) for the high density urban areas which are primarily black could come into the major urban areas and function as family (in the Italian sense) reducing type 2 costs obtaining the franchise, constructing that franchise, and, because type 1 costs are roughly the same for anyone developing a large scale operation, the total cost package could be reduced.

There are several reasons why cable would be appropriate for urban black communities:

1) The receiving sets are already in place (90% of all households in the urban communities already possess them);

2) Broadcast as it exists does not fill all the potential channels with the programming needs of black communities;

3) The needs of black communities would be left untouched by alternative methods of adding more TV channels (e.g.,UHF);

4) UHF like VHF programming is based on advertising revenue and, therefore, for large numbers of people, certain TV users are simply not sponsorable in the conventional sense;

5) What is needed is an end to channel scarcity;

6) At present, technologically, most RV's can receive 83 channels. Very few cities, however, have more than 3 VHF and UHF channels in operation. They are expensive items;

7) On the other hand, each cable station generates a minimum of 20 channels under present law, thus increasing most TV receiving capacity. Where surplus channels exist, communities have a better chance of gaining their use for relatively low level programming needs (eg., English as a second language, community forums, etc.).

From a business development point of view, relative to other types of companies that a community could sponsor, a cable company has the potential to generate a high level of cash flow. Washington, D.C., which was the subject of a Mitre study, has 600,000 blacks in approximately 300,000 households. If half of these households were wired for cable (it would cost 30 million dollars), at a monthly subscriber rate of $5.00, it would generate $750,000 a month in subscriber revenues. Revenues of the scale of 9 million dollars a year are rare in ghetto-based enterprise.

There are also several social service delivery reasons why cable is attractive to communities in urban areas:

Most social service agencies deliver information as a central part of their activities. Cable provides a low cost (especially important today during periods of scarce resources) means of getting needed information to people faster, thus increasing agency efficiency. Data transmission via cable provides opportunities for use of efficient management systems, as well as terminal access for decentralized operations.

6. Job-creation and skill development -- High urban unemployment for blacks in the 1970's is a fact too evident to require assertion. For every 10,000 subscribers, a cable network could add approximately fifty jobs (with an average annual income of close to $500,000) to each city. These are direct employment and they, in turn, generate multiplier effects which, while more difficult to calculate, are nonetheless a real incentive.

7. Relationship to public broadcasting -- Public broadcasting is 53 years old. Presently, there is no formal relationship to cablecommunications (see Table 1:12). However, most cities, when mandated by law to reserve a certain number of channels for public broadcasting chose to use their VHF channels for commercial and, thus most public television stations are UHF. The next section will go into detail on the relationship of cablecommunications to UHF.

TABLE 1:12

COLLEGE INVOLVEMENT WITH THE PUBLIC TELEVISION NETWORK PROGRAMMING

1 Bennett College
2 Bowie State
3 Clark College
4 Houston Tillson, Tex.
5 Virginia Union (in Richmond)
6 Mississippi Valley State - TV Station on campus
7 Texas Southern

Most cable systems are delighted to be able to pick up and rebroadcast public television programs. From the point of the public television stations, cable carries their programming to more people, thus fulfilling the public TV's goal of providing quality programming to as large an audience as possible. And they too play a rating game.

There is much that a cable network could learn from the successes and failures of public broadcasting. The most important

is that without interconnection and a network, first rate programming is not economically possible.

Two very recent developments are of special reference to a cablecommunications network. The first is a financing plan for public television programming which would allow local stations to create special shows for special viewing audiences. The stations would form a cooperative and with a budget of 100 million dollars they would underwrite specific shows of mutual benefit.

The second is more tactical in nature. The Corporation for Public Broadcasting (CPB) recently announced their Public Radio Covera Expansion Project. It is designed to assist in the establishment of full service public radio stations in areas where such services do not exist. Eight Black Colleges in this study have radio stations and can compete for the CPB two-year grants of $43,000 (see Table 1:13)

TABLE 1:13

BLACK COLLEGES WITH RADIO STATIONS

1 Atlanta University
2 Clark College
3 Fisk University
4 Grambling College
5 Hampton College
6 Johnson C. Smith University
7 North Carolina A & T
8 Tennessee State University

The road from a quality radio network with a relationship to public broadcasting is a perfectly valid way to begin a cable TV network.

Relationship to UHF

The first commercial UHF station went on the air in 1952, ten years after commercial production and installation of VHF equipment. Most television receivers at that time had been built exclusively for VHF reception and so it was difficult, especially in areas that were served well by VHF stations, to convince set owners to spend an additional thirty - fifty dollars to convert their sets and antennas for UHF reception.

If the cable industry has a feeling of deja vu with respect to UHF television, they should be reminded that FM radio was greeted by those already in comfortable possession of AM with precisely the same brand of enthusiasm. The zeitgeists were certain that UHF was doomed to be permanent secondary status.

There is nothing in the technology of television which makes UHF inherently inferior to VHF though UHF coverage may be spotty and its signal more readily attentuated by absorption. From a reception point of view, UHF has several advantages over VHF. It is less subject to static interference. It is less subject to ghosts, or reflected signals which cause multiple images because of different signal propagation lengths (UHF is exempt from this problem because its antenna, being highly directive, tends to reject all signals other than those they are adjusted to receive). Picture quality on UHF is as good or better than on VHF reception.

It was the FCC's policy on maximum power and antenna height which allowed the ten year advantage of VHF television to be leveraged into greater coverage than their UHF competitors. For a medium which is based on advertisements, this 'coverage gap' contributed seriously to UHF's economic secondary status.

In the last ten years, however, there has been considerable hope that UHF television would contribute much to the cause of program diversity and localism. UHF does make possible diversity of programming (at least in the sense that more implies different). But every successful UHF station implies a corresponding fragmentation of the broadcast TV audience. VHF revenues are negatively affected by the addition of UHF stations.

It is a fact that UHF stations are not doing well financially. They, too, need a fourth network. Advertising agencies do not value UHF stations highly because their coverage is limited. This, in turn, has made UHF stations unattractive to networks as affiliates. Unable to secure network affiliations, many UHF stations have lacked the one component which means anything to audiences -- high quality programming. Judging from program content, much of UHF is merely older VHF network shows and movies. Network programming tends not to be local in character and there does not seem to be a fourth network coming.

There has been a quantum growth in the use of and need for radio services but spectrum scarcities prevent this demand from being realized. Ironically, the most useful frequency range for many mobile communications services is presently occupied by allocations to UHF broadcasting.

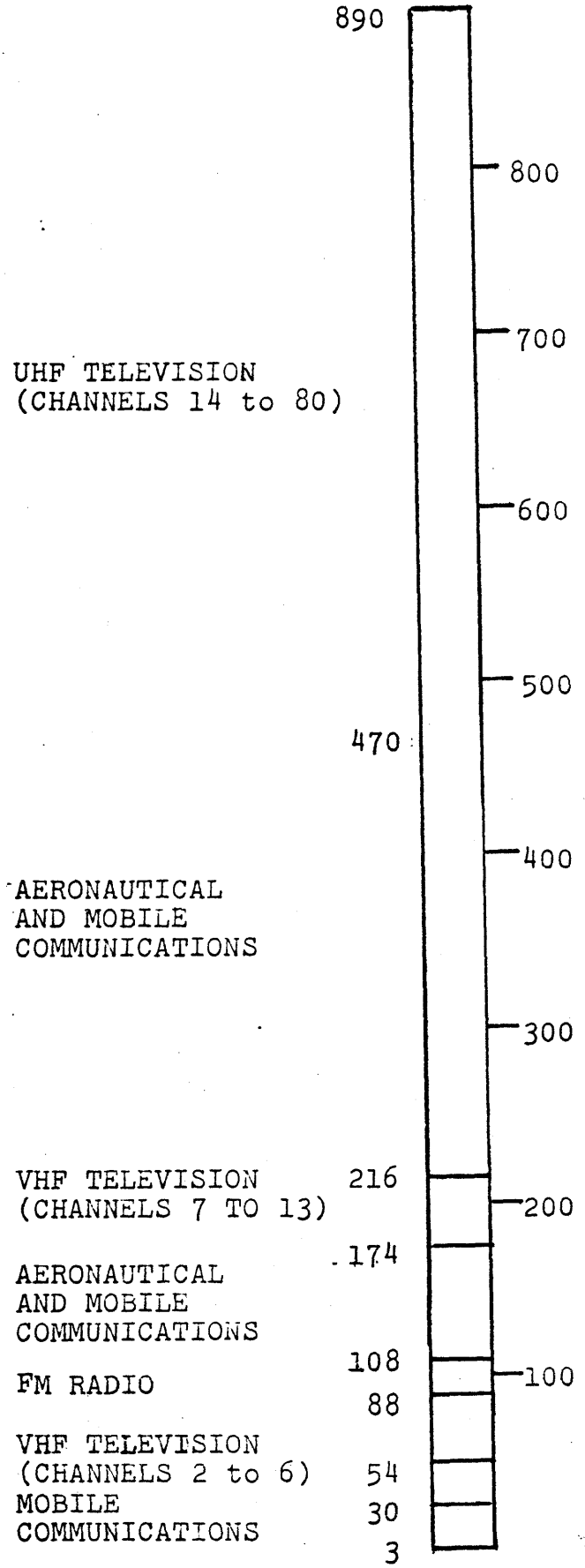
Cable TV could do all that UHF does and more, while avoiding the constraints imposed by limited spectrum space and advertising revenues. Wherever a UHF station would add one new television channel to a market, a cable system would add 10-40 new channels. Where each additional broadcast station fragments advertising revenues, a cable system -- whatever its impact on audience and revenue fragmentation -- could rely on a different economic base to support programming of a local nature. Black College based Cable TV could also foster program diversity, especially in the case of minority groups thereby greatly increasing not only multiplicity of choice but real pluralism of choice as well.

If necessary, the FCC could reallocate the UHF spectrum bands for mobile radio uses (see Table 1:1[4])

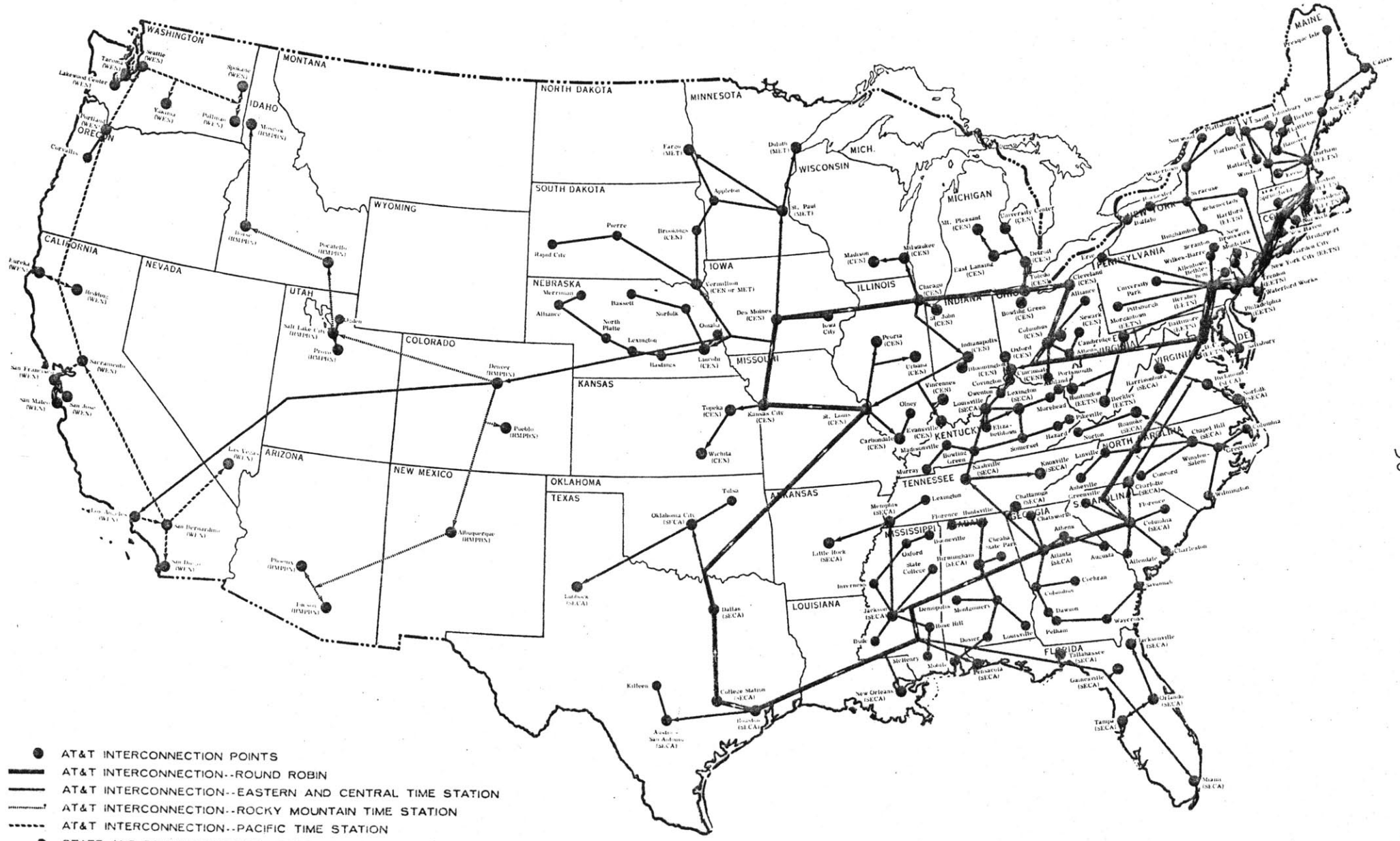
TABLE 1:15

RADIO FREQUENCY SPECTRUM

RADIO-FREQUENCY SPECTRUM extends from three million megahertz, or three million cycles per second, to 890 megahertz and is used for a number of purposes. The upper and lower operating limits of cable television transmission are respectively 300 megahertz and three megahertz.



A final irony, even though UHF stations are running a far distant second to VHF stations and ostensibly require the protection of the FCC against the Cable stations, it is my feeling that it is the VHF stations which stand to lose the most by Cable penetration because Cable will fragment VHF audience share and cause VHF advertising revenues to go down while at the same time picking up and cablecasting the weaker UHF stations in areas where they are not now seen, thus increasing the UHF audience and boosting UHF revenues.



- AT&T INTERCONNECTION POINTS
- AT&T INTERCONNECTION--ROUND ROBIN
- AT&T INTERCONNECTION--EASTERN AND CENTRAL TIME STATION
- AT&T INTERCONNECTION--ROCKY MOUNTAIN TIME STATION
- AT&T INTERCONNECTION--PACIFIC TIME STATION
- STATE AND PRIVATE INTERCONNECTION POINTS
- STATE AND PRIVATE NETWORK INTERCONNECTION

THE DESIGNATION IN ( ) INDICATES THE TRANSMISSION RECEIVED DURING REGIONAL TRANSMISSION HOURS.

NO AFFILIATION IS NECESSARILY IMPLIED.

THE MACRO EFFECTIVENESS OF BLACK COLLEGES

The predominantly black colleges consistently educate the lion's share of black people in this country (see Appendix 2 for listing of Black Colleges in CRC Study). Approximately two-thirds of the blacks who are college graduates (20,000 per year) received their degrees from the 112 predominantly black colleges, most of which are located in the South[7].

Of the 1 percent of those blacks with Ph.D.'s, 75 percent received their doctorate at a black college.

The black colleges are also responsible for educating 85 percent of black physicians and 80 percent of black federal judges; and this on an average annual funding level of 11 million dollars ($550 per student). (See Table 2:01)

The development of a cable networking by a consortium of Black Colleges is not inevitable. It would happen only with considerable planning, much effort and good fortune. I have already stated several reasons why it would be desirable and, according to Marion Hayes of the Cablecommunications Resource Center*, many of the black colleges are presently cablecasting educational and cultural programs on campus, using equipment that is the rival of most cable systems. Some are not, however (see Table 2:02). Through coordinated efforts between the colleges, guidance from black cable specialists, and major assistance in funding, the black colleges could design a communications delivery system unlike any presently in operation or being proposed. It is, in short,

TABLE 2:01

BLACK COLLEGE ENROLLMENT BY STATE

State	Black College Enrollment	Number of Black Colleges Operating	Average Black College Enrollment	Rank
Alabama	10,762	9	1,196	4
Arkansas	3,293	3	1,098	10
Florida	8,111	12	811	6
Georgia	10,894	10	1,089	3
Kentucky	813	1	813	11
Louisiana	12,373	4	3,093	2
Maryland	3,747	4	937	9
North Carolina	14,280	11	1,298	1
South Carolina	6,465	8	808	8
Tennessee	8,081	7	1,154	7
Virginia	8,401	5	1,680	5

SOURCE: The Negro Almanac, 1967

TABLE 2:02

BLACK COLLEGES WITH NO CABLE INTEREST

1 Dillard

2 Elizabeth City State

3 Norfolk

4 Philander Smith

5 Rust

6 Talledega

7 Tougaloo

SOURCE: CRC Preliminary Study on Black Colleges and Cable TV, 1973.

while not a given still a plausible event (see Table 2:03).

FACTS

1 14 have a radio station on campus

2 57 have their own audio/visual department and use video equipment

3 42 have a Learning Resources Center with video equipment

4 52 have TV cameras

5 55 have video tape recorders

6 24 have TV studios with an average of 2 portable cameras

7 38 reside in cities where cable TV is available

8 26 reside in cities which anticipate having Cable TV within the next two yerrs

9 60 colleges are interested in participating in a cable consortium

10 62 would like to offer courses via cable

11 41 colleges are involved with a local commercial radio or TV station and 9 are involved with a commercial station

12 47 said they would begin courses or enlarge the number of courses in broadcasting within the next 5 years.

TABLE 2:03

RANGE OF CABLE CONTACT BY A SAMPLE OF BLACK COLLEGES

	COLLEGE:	COMMENT:
1	Clark	Using cable for community development
2	Choppin State	Members of Mayor's committee on cable
3	F.C. College	Research and Development projects
4	Fayetteville	Supplies programming
5	Knoxville	Advocate for the community with franchise owners
6	Meharry	Use cable studio
7	Miles	Franchise has been granted, shares of stock and studio challenged
8	Stillman	Wiring for closed circuit use
9	Virginia State	Allocated channel

SOURCE: CRC Preliminary Study on Black Colleges and Cable TV, 1974.

Table 2:03 describes the range of cable contact by the Black Colleges surveyed. It is appropriate now to discuss in detail various other strategies of interaction for the Black College. I list them by cable development stages because it seems more useful.

Prior to Construction

Prior to construction of the system to be "designed in," Black Colleges can seek:

a. "upstream" hookups for access directly to the system;

b. wiring to neighborhood centers, day care, senior centers, etc.

c. more easily facilitate the wiring of low income areas.

If Constructed

If the college is in an area where a cable system is currently operating, the range of activities is still large. The regulatory considerations and franchise statement play a major part in what an operator "must" or "may" do.

What to do

The Black College would analyze local needs, college resources and the posture of the operator. A number of actions are possible --

Community Development

-forming local cable advisory group

-establishing educational access authority

-developing policy for municipal use

-educating community interest in public access use

-fostering interest in public interest/information of channels

Service/Information Delivery

-use automated channels

-use "public service" time on local origination

-use public access

-use educational access

-use municipal access

-obtain funds for specific program delivery via cable

Economic Development

-lease channels for use (video/automated or tape, audio, data)

-develop services using cable for delivery (i.e., burglar alarm, direct sales)

-use cable at positive benefit-cost in other forms of service/information delivery

Unfranchised

In an unfranchised area, the Black College could take the valuable role of educating the public, particularly low-income groups and institutions serving low-income groups, of the importance of cable. An active role in the franchising process would insure community "equity" in the system. The CAA might foster community ownership, through municipal, non-profit, or local profit-making ownership models.

Of particular importance becomes the writing of the franchise document. This will help shape the communications capabilities and emphases of the community for the foreseeable future.

Franchised

Once a franchise has been granted, the college could leverage considerable weight with their knowledge and involvement within the franchises area.

Strategies include:

1. grant writing for social service delivery
2. educational software
3. economic development
4. job training

So much for how and where to intervene. The next question is a historical one, i.e. what has the role of blacks been in cable-communications?

An analysis by the Cablecommunications Resource Center of five principle employment areas for cable shows the following minority activity.

Ownership

In 13 percent of the cities at or beyond the planning state, minority ownership was completed or will be considered. Larger cities (250,000 and over) have this option more often than smaller cities.

In those cities where a franchise has been awarded, 12 percent report minority ownership of part or all of the CATV system (see Table 2:04). There are more than 75 organized groups seeking cable television franchises. Minorities presently own nine cable franchises.

The criteria which most of these cable operators used in deciding whether or not an area was profitable includes three broad questions: 1) regular broadcast TV signal quality in the area; 2) number and density of occupied housing units in the franchise area as well as number of miles to be wired; and 3) household income, occasionally.

Some of the things which determine whether or not a Black College will be successful with a cable venture are:

TABLE 2:04

MINORITY OWNED CABLE SYSTEMS

Atlanta, Georgia, Inner City Communication. Franchised August, 1973. Capital needs: $20,000,000

Gary, Indiana, Gary Communications Group. Franchised in September, 1972. Capital costs: $1.2 million

Forrest City, Wynne, Marianna, Arkansas, Cable TV Properties Corporation. Capital needs: $1.6 million

Michigan, Arrow Electronic. Has franchises for a number of small towns in Central Michigan

Seattle, Washington, VANHU Cablevision. Franchised July 1 1973. Capital needs: $450,000

Watts, California, Watts Cable Communications Association. Franchised January, 1974. Capital needed $800,000

Columbus, Ohio, Advanced Cable Corporation. Franchised February, 1974. Capital needed: $1.5 million

Compton, California, Compton Cablevision. Franchised Capital needed: $1,000,000

Tuskegee, Alabama, Southwest Alabama Self-Help Association. Franchised February, 1974.

SOURCE: The Cablecommunications Resource Center, 1974.

a. What is the relationship between the college and various political bodies which have jurisdiction over cable?

b. What is the past history of the local regulatory body with respect to cable guidelines?

c. Do other cable companies exist in the same area and, if so, what are their expansion plans?

d. What is the economic texture of the particular community?

1) What is the population of households?

2) How large is the community in square miles?

3) What is the density?

4) Are the telephone and electrical wires above ground or below ground?

5) How many television channels are presently being received?

6) What is the quality of the television reception?

7) What facilities exist in the community for local program-origination?

8) What activities of special interest could be readily adapted to cable television?

Construction

The huge investment in capital goods (hardware) necessary to install a cable system and the large number of electronic components used in the system, promises an immediate potential for economic development. Though the large cable companies build much of their own systems themselves, there is significant opportunity for sub-contracts with minority firms, particularly for small and medium size firms to install cables and amplifiers. Any manufacturer who is asked to supply that equipment will have a large and continuing production operation. The potential exists for the establishment

of manufacturing facilities within certain cities and, at the very least, one can expect some local assembly and finishing work to be done.

Two trends would further supoort this minority development. Firstly, affirmative action proposals which must be written into all cable franchises in major markets by Federal law allow for considerable minority pressure. If a cable company has failed to demonstrate concretely any commitment in this area, this is a clear and legal ground for denial of recertification. This pressure is almost always present in any urban area with high percentages of minority persons. Secondly, it is clear that any coalition of Blacks owning a franchise will seek to employ Blacks and other minorities at a faster pace.

Presently, only two minority construction firms are in this business:

Arrow Electronics, Earl Drake, President, Kalamazoo, Michigan (Black) started in 1969. Arrow has built systems for major companies.

Video Cable, Inc., Frank Costa, President, Chula Vista, California (Chicano). Video Cable has been constructing cable systems in San Diego subcontracted from Cox Cable.

Manufacturing

As of this time, there are no minority companies producing cable components for systems. This is high technology business with considerable research and development costs upfront of any anticipated revenues. Production also requires heavy outlays for capital equipment.

Marketing

There are minority firms, marketing and engineering consultants who are operating generally on the fringes of this area. As cable moves into the larger urban areas with their substantial minority populations it is reasonably sound to expect that the differential expertise of these minority firms will be more universally in demand. Such was the case for minorities in advertising.

Programming

Very few minorities are involved in program production. This is understandable since at this time there is no cable programming production at all. Sterling Manhattan, one of the largest systems in existence and located in New York City where three networks produce daily and with the reservoir of potential program material that exists, produces only two hours of programming a week. One is produced by New York Magazine, the other by The Village Voice. Without interconnection or some form of networking, cable operators do not seem to be able to afford original cable programming. In the future, two trends may help open up this programming malaise. Firstly, increasingly programming is going to have to be done on local issues and concerns. This will probably be unsyndicated and produced locally.

Secondly, the possibility of regional programming distributed to a larger number of systems is an attractive potential. Cable is quickly reaching a point wherein it has sold all of the systems that can be sold on just the strength of rebroadcasted TV signals. Something else will be required to sell the system. Programming of high quality but lower cost seems to be the answer. Cable systems in minority areas are going to have a prerequisite amount of minority programming. The relatively large number of independent minority film-makers are a source of initial work in this area.

ECONOMICS OF CABLE

It is a continuing purpose of this paper to underline those aspects in the development of cable television which correlate positively with the development of broadcast radio and television.

The last section on the economic implications of cable is especially important because much of the cable's attractiveness to community groups rests on its economic prowess, especially with respect to the generation of employment opportunities.

The fundamental economic reality of cable television is significantly different from that of broadcast television. This difference is a result of channel scarcity, an inherent technical characteristic of broadcast television. This scarcity has definite economic consequences which relate to the broadcasters' interest in limiting the development of cablecommunications.

Both the broadcasting and the cable industries seek to maximize their number of viewers. And if one envisions a cable system's network of subscribers as similar to that of public utilities' control over a particular geographic market, the cable system can be readily identified as a technical or natural monopoly. While,on the average, competition among broadcasters may be an efficient means of promoting program diversity, the resulting series of competing firms will probably fail to achieve either the firm's goal or the social good by fragmenting the market.

In the cast of a broadcaster, the entry of a cable system may decrease revenues which will cause the curtailment of programming and ultimately the cable competitor would gain control of the market. According to the theory of monopoly, the consumer would suffer because of the increase in price for television services and the corresponding decrease in the quantity of programming produced. Total consumer satisfaction would be lowered in this monopoly situation. This example explains the basic objection of the FCC to the emergence of cable television.

To overcome this economic objection, a monopolist could practice price discrimination. Cable television is a non-transferrable good (a prerequisite for the use of price distrimination). The monopolist's output could be made equal to that output in a competitive market by selling the cable service at different prices to different buyers. The cable operator could charge different rates for different levels of income or for different levels of television viewing.[8]

The superior channel capacity of cable allows for greater programming diversity and also puts into place viewer preferences through a price system which is potentially more responsive than the present Neilsen ratings and the free television rule, which make it impossible for a viewer to bid for programs which represent to him a more valuable alternative. The free television rule is a function of the fundamental character of over-the-air broadcasting in which the nature and value of programs (i.e., the cost of scarce resources in alternative users) is determined uniquely by the productivity of advertisements.

This is the heart of the public good aspect present in over-the-air television. To many critics of cable television, the inherent problem is that cable television violates the rules of Pareto-optimality and could possibly exclude some people from quality television service because of an inability to pay for cable service. A contrasting opinion is offered by Paul Samuelson:

"The essence of the public-good phenomenon is not intrinsically tied up with the inability to 'exclude'consumers from some common service. . . we would still be faced with an instance of intrinsic increasing returns and there is an element of this public-good dilemma in all such areas."[9] The economics of scarcity derived from an inherently limited frequency band (see Table 1:14) set a pattern of development for radio and later for VHF and UHF television with few options available. This economics, peculiar to conventional television, is changed with the abundance of channels implicit in a cable system.

For an urban community, this is a significant distinction. Cable has a potential future as a way of communicating what is highly responsive to urban residents. The long-run impact of urban cable communications could produce a change in land use patterns and life styles in such areas as:

Community Development:

a. business opportunities could add new sources of revenues and jobs to an area.

b. community pride and cohesion created by programs originating from the neighborhood.

c. information centers to remedy legal and employment problems of area residents.

d. telecasts of meetings pertinent to community interests.

Entertainment: increases in both the quality and quantity of television programming.

Marketing: two-way response offering demonstrations and retail shopping.

Politics: greater access to the candidates via low cost programming and with two-way cable the possibility of instantaneously conducting opinion polls.

Safety: emergency reporting for fighting crime and fire.

Transportation: video monitoring and computerized traffic control to avoid everyday traffic problems.

Work: high speed information flow through two-way response and electronic information handling system.

A close look at some of the potential educational objectives of special interest to a consortium of Black Colleges that could be fulfilled by a modern cable system would include:

Item	Technique
Accessing data	still-framing of microfilm
Career information	banks of current video tapes and films available for individual access
Distributing printed information	videotape recorders and facsimile printing machines attached to TV sets for recording printed data
Efficient film distribution	access of films from central resource center instead of using the "pony express"
Finding learning resources	computerized locator service in media centers, libraries, museums, etc.
Individualized learning	computerized learning programs, video tape banks of ITV programs
In-service and college credit courses	in-service and open-university programs and viewing in schools and homes
Language and mathematics assistance	computer access to dictionaries, thesauruses and calculators
More flexibility for open-circuit	videotaping and repeating on alternative schedules
Reliability for standardized tests	controlled directions and pacing from central agency
School-community communications	programs to report on school activities and to further public relations

Item	Technique
Security of school property	closed-circuit TV surveillance by central agency
Sharing student-produced TV programs	programs fed for individual schools to dub
Staff communications	district-wide staff meetings via television
Valid selection of new materials for purchase	regular scheduling of new films for teacher preview and feedback

In 1969, a prospectus on cable communications submitted to the FCC by the Electronics Industry Association forecast an ekistical[10] change as a result of cable television.

> Broadband communications is the tool not only to provide the means for new styles in human settlements, but also to rebuild, in a sociological sense, the crowded inner core of the cities. Broadband communications systems using cable can be structured to promote small, self-determining communities within the massive megalopolis. Through these, city dwellers find order, identifiable territory, community pride, and opportunity to participate and vote on matters that can be of local option -- education, cultural pursuits, recreational interests, etc.[11]

On the left hand, the future of cable is seen as a means of communications highly responsive to human needs and also profitable business enterprise. The cable industry expects to generate $4.4 billion in income in 1980. It could create over a million new jobs many of which require only short training periods (see Table on SVP in section on Employment).

TABLE 3:01 *

THE SIZE AND GROWTH OF THE CTV INDUSTRY IN THE U.S.

1952 - 1973

Years (as of Jan. 1)	Systems	Subscribers	Annual Percentages Increase in Subscribers
1952	70	14,000	---
1953	150	30,000	114.0
1954	300	65,000	116.0
1955	400	150,000	131.0
1956	450	300,000	100.0
1957	500	350,000	16.5
1958	525	450,000	28.5
1959	560	550,000	24.0
1960	640	650,000	18.0
1961	700	725,000	11.5
1962	800	850,000	17.2
1963	1,000	950,000	11.7
1964	1,200	1,085,000	14.2
1965	1,325	1,275,000	17.4
1966	1,570	1,575,000	23.5
1967	1,770	2,100,000	33.2
1968	2,000	2,000,000	33.0
1969	2,260	3,600,000	28.5
1970	2,490	4,500,000	25.0
1971	2,640	5,300,000	17.7
1972	2,841	6,000,000	13.2
1973	2,991	7,300,000	21.6

* Same as Table 1:09 in first section.

At this time, the majority of cable systems offer a maximum of 12 channels of one-way service and most systems carry a selection of retransmitted local and distant signals with some carrying additional programming, usually a special interest channel.

To give a first-hand idea of the dimensions of CTV, the number of systems, the number of subscribers and rates of increase for the period 1952-1973, see Table 3:01 , The Size and Growth of the CTV Industry in the U.S. The recent growth rate of approximately 30 percent per year could conceivably force a restructuring of the television industry. The estimated national average penetration of cable television is approximated by R.E. Parks. The results are presented below.

TABLE 3:02

Expected Nationwide Average Penetration

Number of Stations Received	Percent of TV Households[a]	Estimated Penetration	Percent on Cable[b]
2 or fewer	3.4	.60	2.0
3 to 6	64.0	.50	32.0
7 or more	32.6	.42	13.7
	100.0		47.7

Notes: [a] From Nielson national sample in September 1967 cited in "A Study of Distribution methods for Telecommunications (Complan Associates)."

[b] Column 2 times column 3.

A test of Park's model may be found in the Mitre Corporation's study of a potential urban system for Washington, D.C. Mitre's market surveys indicate a final penetration in the top 25 markets will range from 9 to 41 percent with subscriber fees ranging from $5 to $6.90 per month.[12] The estimated penetration for Washington, D.C. with one-way service is 76%.[13]

The economic implications of the difference between cable and broadcast have been outlined. It should be noted, however, that there are different configurations for the ownership of cable and each has unique economic implications. Table 3:03 lists the different ways of owning cable.

TABLE 3:03

OWNERSHIP MODES FOR CABLE

A. Private
   1) Commercial
      a) Multiple system operator
      b) Independent local private ownership
      c) Joint ventures
   2) Non-Commercial
      a) Non-profit institution
      b) Local non-profit consortium
      c) Subscriber cooperative

B. Public
   1) Municipal
   2) Special Authority
   3) Leased

The style of cable ownership has a definite impact on both programming and costs. The numerical effect is hard to pinpoint but some sense of the direction can be gotten from a set of ordinal rankings.

Capital Costs. Large firms are usually able to generate capital through reinvested earnings and they can borrow funds at a prime (i.e., lower) rate. The consortium, because of its size, should be able to acquire credit more cheaply than an individual cable operator, Black or non-Black. The position of the local operator can be strengthened during the construction phase by the use of several regional cable subcontractors who are in the business of just hooking up homes for a per diem flat rate. Capital costs would be cheapest for the:

1. Multi-Systems Operator
2. Consortium of Black Colleges
3. Non-Black Local Cable Operator

Wages. Contrary to what might be expected, the Multi-System Operator pays less on the average for the same jobs than local operators (much like Harvard) because they offer far-reaching corporate mobility and other indirect benefits (this is confirmed by the Fiscal 1973 Records of the Teleprompter Corporation). If it is true, as often hypothesized, that Blacks (like other ethnics) prefer to be supervised homogenously (i.e., by their own kind) and would be willing to work at a slightly lower wage in order to have

this environment and a greater potential for advancement given this diminished exposure to discrimination, one would expect this pattern to emerge. Wages benefits are highest for the:

1. Black Local Cable Operator and the Consortium of Black Colleges
2. Non-Black Local Cable Operator

Management. The difference between success and failure in the cable business may have less to do with the skill which a job requires than with the way in which the labor force is organized and managed. Management expertise, while available to the local cable operator, is an additional cost. The Multi-Systems Operator has a supply of in-house cable experts and the consortium could draw on the talents and research strengths of its combined faculty. But it is the well-grounded personnel of the Multi-Systems Operator which has the advantage. Thus, costs of management would be greatest for:

1. Multi-Systems Operator
2. Consortium of Black Colleges
3. Non-Black Local Cable Operator

Production of Programming. All cable operators have an incentive to produce programming. But systems have more opportunity to show their product and so their unit costs are lower. Supply of programming would be highest for:

1. Multi-Systems Operator
2. Consortium of Black Colleges
3. Black Local Operator

Diversity of Programming. While both the Multi-Systems Operator and the consortium would have an advantage in the production of programming, it is the local operators who have the edge in terms of being responsible to a community's needs for program diversity. A consortium could share this responsiveness. Diversity of programming would be greatest for:

1. Consortium of Black Colleges
2. Non-Black Local Operator and Black Local Operator

Likelihood for Networking. As in program production, system operators have an advantage in the area of interconnection and networking. A consortium of Black Colleges would have a discrete strategy and more of an incentive than the Multi-Systems Operator. Aptitude for networking would be highest for:

1. Consortium of Black Colleges
2. Multi-Systems Operator
3. Non-Black Local Operator

Penetration (i.e., the relationship between the actual number of subscribers and the potential number of subscribers). Although the Multi-Systems Operator has the advantage in terms of the depth of marketing expertise, the Local Operator (Black or Non-Black) will have the advantage of being an insider. The consortium has the same access to expertise as the Multi-Systems Operator. It is at once a local and a system, so the consortium should have the greatest advantage of all here. Thus, net penetration should

be greatest for:

1. Consortium of Black Colleges
2. Non-Black Local Operator
3. Black Local Operator

Taxes. The Multi-Systems Operator would be expected to make the largest profits, while the consortium would be a non-profit corporation. Hence, corporate taxes would be greatest for:

1. Multi-Systems Operator
2. Non-Black Local Operator and Black Local Operator

Ninety-seven percent of all cable systems are owned by private commercial (for profit) companies, half of these by the ten larges Multiple Systems Operators (MSO's).

About twenty-five percent of the nation's cable subscribers are served by individually-owned systems.

There are approximately thirty subscriber owned non-commercial cooperatives. They tend to be very small systems with little capacity for outside financing.

The publicly owned system may be the most likely mode for the future. There are 14 municipally owned systems currently operating in the United States (see Table 3:04). And, according to the International City Management Association, 45 percent of the cities at or beyond the planning stage plan to consider municipal ownership. The largest cities (over 500,000) plan to consider municipal ownership of the system more than the other cities. Nineteen percent of the cities plan to finance the CATV network by bonds or through current budget expenditures.

The reason for the increase in public ownership is partly a function of the severe limitations in acquiring sufficient capital to develop their current properties that the present MSO's are facing. It requires a large investment to build a cable system. Traditionally, private enterprise has assumed such risks under the attraction of the potential for significant long-range profits. At times, however, government itself has undertaken the effort, particularly where there were important public services to be provided. Municipal transportation systems, power plants and water companies are precedents for cable.

TABLE 3:04

MUNICIPALLY-OWNED CABLE SYSTEMS

City	Population	Channel Capacity	Subscribers	Installation	Per Month
Frankfort, Ky.	23,000	12	4,750	-	-
Walkertown Station, Ky.	1.500	12	350	-	-
Crystal Falls, Mich.	2,203	5	352	$30	$2.00
Norway, Mich.	3,800	-	1,086	$60	-
Jackson, Minn.	3,505	12	850	$100	$1.75
Ironton, Ohio	18,705	12	3,000	-	-
Blossburg, Pa.	1,965	12	600	$109	$3.00
Pitcairn, Pa.	5,385	12	610	$75	$2.00
Rouseville, Pa.	923	7	208	-	-
Pleasant View, W. Va.	-	5	30	$60	-
San Bruno, Cal.	40,000	20	3,000	free	$4.75
Opp., Ala.	7,000	12	750	free	$4.75
Sumas, Wash.	720	12	720	$10	$4.50
Vintage of Boaz, Wis.	-		-	-	

Increasingly, as communities become aware of the many benefits of cable, the private operator is being required to make additional concessions to local community requests prior to franchise award. A recent example is the $2.5 million production package which accompanied the acquisition of the Boulder, Colorado franchise by Teleprompter.

Additional pressure is being placed on the MSO's in the form of taxing legal battles, and moves to prevent consolidation of interest in a few companies. At a recent public meeting in Darien, Ct., Howard E. Hauseman, Chairman of the Public Utility Commission, State of Connecticut, flatly stated that Teleprompter Corporation would not be considered for additional franchises in Connecticut, since it owns three and is "too big."

Public ownership has certain problems. Firstly (at least in terms of polemics) is the concern for government control of media. A second issue involves the existing configuration of the law in many of the states which prohibits the possibility of public ownership using industrial development financing.
Table 3:05 indicates the relative possibility of public financing for each state. Since actual cable precedents are rare, I have used the water and sewer legislation as a proxy (in most cases, the kinds of powers required are identical).

TABLE 3:05

APTITUDE FOR PUBLIC FINANCING BY STATE

STATE	POSSIBILITY
Alabama	Yes
Arkansas	No
Florida	No
Georgia	Yes
Louisiana	No
Maryland	No
Mississippi	Uncertain
North Carolina	Yes
South Carolina	No
Tennessee	Probable
Virginia	No

SOURCE: Author's Calculation

A third issue and one of long run significance involves what is to be done with any net profits from such a cable system. While cable is too new to say definitely, the history of municipal electric power suggests that in the trade-off between lower taxes (a surplus dividend) and reinvestment for maintenance and growth, a politician will move to keep taxes down. This appears to be an inherent bias in public systems and should be taken into account in any franchise agreement.

Financing through tax-exempt bonds provides considerable leverage for a city in overall capitalization costs. While a number of communities have considered municipal ownership, the complexity of systems design and development has served to inhibit.

If a hybrid combination of public development and private operation is found desirable (such as is outlined below) public financing will enable private firms that do not necessarily have large amounts of investment capital to participate. This would tend to strengthen the potential role for minority enterprise. (See Appendix 3)

Hybrid Financing Method

Steps:

1. City or other tax-exempt authority or entity borrows 65-80% of the capital funds necessary to purchase the system through the issuance of tax-exempt bonds. Limit estimated by state law, bonding feasibility is usually determined by economic viability of the project.

2. Third-party taxpayer provides balance of funds necessary to complete purchase (20-35%).

3. Third-party taxpayer executes a finance lease (they lease 100% of equipment) or installment purchase contract with tax-exempt issuer of bonds. The installment purchase contract is structured to service the principle and interest on the bonds.

4. The third-party owner/lessor executes a true lease with the operator/lessee. The lease payments under the true lease will provide sufficient revenues to the third-party lessor to service the installment purchase contract or finance lease plus provide the third-party lessor with a return on their investment.

5. At the end of the initial term, the operator/lessee may renew the lease or purchase the equipment at its fair market value. There can be no preset value/price on the equipment (IRS regulation). The initial lease term must be for a period shorter than the franchise term by a substantial period of time (3 - 5 years) to constitute a true lease.

Exposure:

1. Tax-exempt issue of bonds lends 65%-80% on a non-recourse basis or executes a finance lease (exposure 65-80% of systems costs).

2. Third-party taxpayer/owner invests 20-35% of equipment cost with a non-recourse note or contract to tax-exempt lender or lessor.

3. Operator invests the required working capital to maintain and expand the franchise.

4. Investment banking firm places the tax-exempt bonds issued by the tax-exempt issuer.

5. Lease originator places the equity financing 20-35% of the system cost with the owner, third-party lessor.

TABLE 3:06

IMPACT OF HYBRID FINANCING METHOD

Amount to be Financed	Type of Financing	Rate	Cost per Net Year	Difference
1 million	A. public debt (non-tax-exempt)	11 percent	$169,800	
				> $27,422
1 million	B. public debt (with recommended leverage leasing)	7 percent	142,370	
				> 6,510
1 million	C. tax exempt (industrial revenue)	6 percent	135,868	
				> 12,578
1 million	D. tax exempt (with recommended leverage leasing)	4 percent	123,290	

TOTAL ANNUAL SURPLUS $42,510

SOURCE: Author's Calculation

Employment

While attempting to estimate the manpower requirements for cable franchises, I found little agreement on how many jobs would be created by cable and so decided to use task analysis as a means of determining precisely what the manpower requirements and the resident distributions of skills (the fit) for cable would look like. To my knowledge, this has not been done for the cable industry; what was being widely accepted were industry quotations which,upon more rigorous analysis, proved to be optimistic.

The first step is to determine which jobs exist in an average cable franchise. To do this, I used the corporate records of Teleprompter Corporation, the largest company in the industry with one million subscribers in 49 states. They break each of their local franchise operations into 4 cost areas (or activity areas), i.e., technical, administrative, sales, and local programming. An average teleprompter franchise has 7,000 subscribers and employs 45 persons with a total annual wage bill of $208,480. The average worker made close to $10,000 ($9,928) per year in 1974. (See Table 3:07).

TABLE 3:07

JOBS THAT EXIST IN AN AVERAGE CABLE FRANCHISE

Four Centers of Activity

1 Technical
2 Administrative
3 Sales
4 Local Programming

Franchise Manager		$26,000
1 Technical (20)	NUMBER	SALARY
Linemen	8	$10,400
Cable Installers	5	7,280
Service Technicians	3	6,760
Line Technicians	1	11,440
Bench Repairman	1	8,320
Chief Technician	1	15,000
Project Coordnnator	1	10,000
Dispatcher	1	7,000
Total	20	
2 Administrative (6)		
Office Manager	1	$9,000
Clerical/Accounting	1	7,176
Incoming Calls for Service and Records Therin	1	6,448
Secretarial Support for Sales	1	6,656
Clerical/General	1	6,500
Secretary	1	6,800
Total	6	
3 Sales (13)		
Salesmen	12	$9,000
Sales Manager	1	24,200
	13	
4 Local Programming (5)		
Program Director	1	$10,000
Video Technician	1	9,000
Cameraman	1	7,700
Soundman	1	7,000
Production Assistant	1	6,600
	5	

SOURCE: Author's Calculation

Using job descriptions, I then attempt to locate the appropriate occupational title for each of the 20 employee types in an average cable franchise. These titles are found in the Dictionary of Occupational Titles, 1965, Volume 1, Definitions of Titles, 3rd Edition. It is difficult to overemphasize the complexity of locating the precise correspondence of job to job title. The Dictionary of Occupational Titles lists over 240 different kinds of managers, defines over 35,550 titles, and it makes precise distinctions between the manager of a hotel, the manager of a motel, the manager of a motor hotel, the manager of a motor inn, and the manager of lodging facilities, not to mention the manager of a boarding house.[14]

> MANAGER, SALES 163.118. Directs sales division planning and operations; Directs sales department staffing, training, and performance evaluations to develop and control sales program. Coordinates sales distribution through establishment of sales territories, quotas, and goals. Assigns sales territory to selling personnel. Evaluates dealer sales and assists dealers through training programs and sales promotion. Reviews market analyses to determine customer needs, volume potential, price schedules, and discount rates and develops sales campaigns to meet company goals. Directs product simplification and standardization to eliminate unprofitable items from sales line. Represents company at trade association meetings to promote product. Supervises liaison between sales department and other units. Analyzes and controls expenditures of division. Assists engineering division in preparation of manuals and technical publications. Analyzes sales statistics to assist management in policy formulation. May direct sales for manufacturer, retail store, wholesale house, jobber, or other establishment. May direct and supervise product research and development. May recommend or approve budget, expenditures, and appropriations for research and development work.

For job titles which were not readily classified, it was necessary to use a second best solution.

The first task is to locate the occupational group in Volume 2 of the Dictionary to which the job being referenced belongs to [15]

> 821. Occupations in Assembly, Installation, and repair of Transmission and Distribution Lines and Circuits.
> This group includes occupations concerned with erecting and repairing powerlines and circuits for transmission and distribution of electricity, and assembling and erecting related equipment and structures.

and then check each job title in Volume 1 to decide which title most closely approximates the particular franchise position. It should be noted here that, again, the Dictionary is uncommonly specific.

For example, the job classification Lineman appears in two separate categories:

821.281 Lineman
821.381 Lineman

The correct DOT classification for the cable franchise job title Lineman is 821.281 and is derived by comparing the essential elements of information in the job description which states the actual work to be performed and the range of possible alternate titles within the relevant 3 digit category.

While this technique is useful for determining which of two headings is most appropriate between like titles, it becomes critical when the job title required is an unlisted one. For example, there is no DOT classification for Cable Installer. Using this scanning process, one discovers that an alternate title for Lineman (821.381) is a cut in and cut out man, and this coincides with the essense of the job description for the Cable Installer; hence, even though the DOT does not list explicitly a classification Cable Installer (Radio-TV Broadcasting) it is possible to precisely locate the job title Cable Installer and hence the GED and SVP requirements.

Having determined the job title, the next step is to analyze the DOT code number for each position. The first three digits locate the job by industry. For example:

CABLE TV JOB TITLE[16]		LEVEL
1	Professional, Technical and Managerial Occupation	(Category)
18	Managers and Officials	(Division)
184	Transportation communication and utilities industry managers and officials	(Group)

For this discussion, the last three digits of the six digit code number are relevant. They isolate the job in a particular work group by the homogeneity of the actual work performed.

They express the degree of complexity required by each particular job. The lower the number, the more complex the task required.

The last three digits of the code number are based on the following findings of U.S. Employment Service research:[17]

1. Every job requires the worker to function in relation to Data, People, and Things, in varying degrees.

2. The relationships specific to Data, People, and Things can be arranged in each case from the simple to the complex in the form of a hierarchy so that, generally, each successive function can include the simpler ones and exclude the more complex functions.

3. It is possible to express a job's relationship to Data, People, and Things by identifying the highest appropriate function in each hierarchy to which the job requires the worker to have a significant relationship.

4. Together, the last three digits of the code number can express the total level of complexity at which the job requires the worker to function.

DATA (4th digit)	PEOPLE (5th digit)	THINGS (6th digit)
0 Synthesizing	0 Mentoring	0 Setting-Up
1 Coordinating	1 Negotiating	1 Precision Working
2 Analyzing	2 Instructing	2 Operating-Controlling
3 Compiling	3 Supervising	3 Driving-Operating
4 Computing	4 Diverting	4 Manipulating
5 Copying	5 Persuading	5 Tending
6 Comparing	6 Speaking-Signaling	6 Feeding-Offbearing
7 No significant	7 Serving	7 Handling
8 relationship	8 No significant relationship	8 No significant relationship

The next step is to find the precise worker trait arrangement. There may be more than one but one is usually the most appropriate. For example, the DOT number .188 refers to industrial engineering, surveying, prospecting, and techinical writing, and the implications of the decision surface because the GED, and SVP classifications are different for each classification.

The worker trait arrangement gives detailed information as to the work performed, the work requirements, clues for relating an applicant to a job and to the job requirements, specifics about the training needed for the job and the methods of entry, as well as the general educational development (GED) and specific vocational preparation (SVP) levels.

The GED scale describes those aspects of education (formal and informal) that contribute to the worker's aptitude. It is education of a general nature which does not have a recognized, fairly specific, occupational objective. Ordinarily such education is obtained in elementary school, high school, or college.

The GED scale is not given in a truly usable form so it is necessary to convert each GED rating to a 'years of schooling' equivalent. An article by MIT Professor Richard Eckaus[18] gives the equivalent coefficients needed.

GENERAL EDUCATIONAL DEVELOPMENT:

Level	School Year Equivalent in Years
1	0
2	4
3	7
4	10
5	12
6	16
7	18

The SVP scale is a scale which describes the amount of time required to learn the techniques, acquire information, and develop the facility needed for average performance in a specific job-worker situation.

SPECIFIC VOCATIONAL PREPARATION:

Level	Time
1	Short demonstration
2	0+ -- 1 month
3	1 to 3 months
4	3 to 6 months
5	6 months to 1 year
6	1 to 2 years
7	2 to 3 years
8	4 to 10 years
9	10 years

SOURCE: U. S. Department of Labor -Dictionary of Occupational Titles, 1965, Vol. 2, Definitions of Titles, Third Edition, p. 187

Table 3:08 shows the GED and SVP rating for each cable job.

The relationship between each cable franchise job and the length of time required to train (via SVP) a new worker to capacity is given in Table 3:09.

Table 3:10 shows the relationship between the cable franchise jobs and the years of schooling.

Exactly how many Black persons have the required level of schooling for each cable job in each city in the study is the subject of Table 3:11. Though each of these cities has a sufficient number of Blacks who possess the required educational levels for the cable franchise jobs, it should be noted that these are macro data and are in reality only years of school completed. There is no authentication whatever on the quality of those years of schooling, the range of subject matter taught or the performance of the students in school.

Table 3:12 establishes that a sufficient supply of cable qualifiable manpower exists in each of the Black College cities and the task analysis shows unambiguously that there is a sufficient supply of "raw manpower" in each of the selected Black College cities. What is needed is the required manpower training as outlined in Table 3:09.

Job creation is an important criterion for deciding to develop a cable system. A cable television system constructed in a city the size of Boston could directly employ 50 persons, as

managers	service technicians	salesmen
linemen	line technicians	producers
cable installers	bench repairmen	video technicians
	general clerical	sound technicians.

These cable-created jobs do not now exist.

An equally important but often hidden aspect of new job creation is the bonus payoff (called multiplier effects) in increased demand for other goods and services which, by itself, creates additional jobs. Multiplier effects are difficult to calculate and beyond the scope of this paper. Direct and indirect employment taken together, however, serves to strengthen the college community's economic base.

TABLE 3:08

CABLE TV JOB TITLE	GED	SVP	DOT
Franchise Manager	5	8	184.118
Lineman	4	6	821.281
Cable Installer	3	6	821.381
Service Technician	4	6	720.281
Line Technician	4	5	193.282
Bench Repairman	4	6	722.281
Chief Technician	4	7	722.131
Project Coordinator	5	8	191.118
Dispatcher	5	8	957.168
Office Manager	4	6	169.168
Clerical/Accounting	3	2	210.388
Clerical/General	3	2	206.388
Secretary	4	6	201.368
Salesman	4	2	253.358
Sales Manager	4	6	163.118
Program Director	4	6	184.168
Video Technician	3	4	194.782
Cameraman	4	7	143.062
Soundman	4	5	194.282
Production Assistant	4	5	963.168

SOURCE: Author's Calculation

TABLE 3:09

VOCATIONAL EDUCATION REQUIREMENTS FOR CABLE FRANCHISE JOBS

Job Title	Vocational Education Requirements
bench repairman	1 year
cable installer	1 year
cameraman	2 years
chief technician	2 years
clerical/accounting	1 month
clerical/general	1 month
dispatcher	4 years
franchise manager	4 years
lineman	1 year
line technician	6 months
office manager	1 year
production assistant	6 months
production director	1 year
project coordinator	4 years
sales manager	1 year
salesman	1 month
secretary	1 year
service technician	1 year
soundman	6 months
video technician	3 months

SOURCE: Author's Calculation

TABLE 3:10

GENERAL EDUCATION REQUIREMENTS FOR CABLE FRANCHISE JOBS

Job Title	General Education Requirements (Equivalent years)
bench repairman	10
cable installer	7
cameraman	10
chief technician	10
clerical/accounting	7
clerical/general	7
dispatcher	12
franchise manager	12
lineman	10
line technician	10
office manager	10
production assistant	10
production director	10
project coordinator	12
sales manager	10
salesman	10
secretary	10
service technician	10
soundman	10
video technician	7

SOURCE: Author's Calculation

TABLE 3:11

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Albany, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	2,284	1,772	4,056
10	2,326	7,367	9,693
12	1,524	8,979	10,503
Median years completed	7.8	11.5	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Atlanta, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	22,656	16,305	38,961
10	29,365	60,078	89,443
12	25,571	59,876	85,447
Median years completed	10.0	12.2	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Augusta, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	3,891	2,676	6,567
10	2,480	6,169	8,649
12	1,733	6,065	7,798
Median years completed	7.6	11.9	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Baltimore, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	42,375	39,794	82,169
10	54,180	119,152	173,332
12	37,958	104,371	142,329
Median years completed	9.6	11.0	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Baton Rouge, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	4,856	3,428	8,284
10	4,201	15,048	19,249
12	3,334	21,502	24,836
Median years completed	8.7	12.3	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Charlotte, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	6,253	5,564	11,817
10	8,345	30,041	38,386
12	6,158	30,786	36,944
Median years completed	9.7	12.2	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Columbia, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	3,389	2,305	5,694
10	3,331	10,596	13,927
12	2,220	9,565	11,785
Median years completed	8.9	12.2	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Durham, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	3,680	3,166	6,846
10	3,578	10,248	13,826
12	2,881	9,761	12,642
Median years completed	9.4	11.6	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Fayetteville, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	1,606	1,287	2,893
10	1,947	5,300	8,247
12	1,907	7,241	9,148
Median years completed	10.0	12.3	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Greensboro, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	2,937	4,080	7,017
10	4,302	16,743	21,045
12	3,396	16,050	19,446
Median years completed	10.7	12.1	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Huntsville, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	1,507	1,783	3,290
10	1,567	8,039	9,606
12	983	22,206	23,189
Median years completed	9.5	12.6	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Jacksonville, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	10,816	12,323	23,139
10	13,764	62,366	76,130
12	10,661	87,680	98,341
Median years completed	9.5	12.1	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Knoxville, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	1,926	4,143	6,069
10	2,557	17,519	20,076
12	2,432	26,787	29,219
Median years completed	9.9	12.1	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Little Rock, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	2,748	2,371	5,119
10	3,944	12,532	16,476
12	2,962	24,321	27,283
Median years completed	10.1	12.3	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Macon, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	5,547	5,136	10,683
10	4,591	14,903	19,494
12	2,780	15,685	18,465
Median years completed	7.9	11.0	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Nashville, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	1,926	11,511	13,437
10	2,557	47,256	49,813
12	2,432	67,992	70,424
Median years completed	9.8	12.1	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — New Orleans, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	26,512	21,110	47,622
10	30,088	62,734	92,822
12	20,205	72,443	92,648
Median years completed	9.1	11.4	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Norfolk, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	9,098	8,461	17,559
10	10,514	35,301	45,815
12	6,726	40,619	47,345
Median years completed	9.3	11.8	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Petersburg, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	2,224	1,594	3,818
10	2,122	3,882	6,004
12	1,523	3,981	5,504
Median years completed	8.7	11.2	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Raleigh, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	2,724	2,657	5,381
10	2,908	11,955	14,863
12	2,402	13,305	15,707
Median years completed	9.5	12.5	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Richmond, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	12,084	10,805	22,889
10	14,662	34,793	49,455
12	8,514	29,292	37,806
Median years completed	9.5	11.8	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Tallahassee, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	1,352	699	2,051
10	1,493	4,155	5,648
12	1,045	8,058	9,103
Median years completed	9.7	12.7	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Tuscaloosa, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	1,846	1,327	3,173
10	1,971	6,355	8,326
12	1,088	8,050	9,138
Median years completed	8.3	11.9	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Washington, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	37,681	19,484	57,165
10	71,946	88,337	160,283
12	73,952	110,767	184,719
Median years completed	11.3	12.6	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

SCHOOL COMPLETION RATES IN BLACK COLLEGE CITIES

YEARS OF SCHOOL COMPLETED — Winston-Salem, 1970

Years of School Completed	Blacks 25 years of age and over	Whites 25 years of age and over	Total
7	4,298	4,804	9,102
10	4,795	15,995	20,790
12	4,035	14,914	18,949
Median years completed	9.6	11.6	

SOURCE: Social Characteristics of the Black Population for Areas and Places, Summary of Social Characteristics for Places of 50,000 or More, U.S. Census, 1970.

TABLE 3:12A

NUMBER OF RESIDENTS WITH THE REQUIRED AMOUNT OF GED EDUCATION BY CITY

Cable TV Job Titles	Alabama		Arkansas	D.C.	Florida		Georgia				Louisiana	
	Huntsville	Tuscaloosa	Little Rock	Washington	Jacksonville	Tallahassee	Albany	Atlanta	Augusta	Macon	Baton Rouge	New Orleans
bench repairman	8,039	6,335	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
cable installer	1,783	1,327	2,371	19,484	12,323	699	1,772	16,305	2,676	5,136	3,428	21,110
cameraman	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
chief technician	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
clerical/accounting	1,783	1,327	2,371	19,484	12,323	699	1,772	16,305	2,676	5,136	3,428	21,110
clerical/general	1,783	1,327	2,371	19,484	12,323	699	1,772	16,305	2,676	5,136	3,428	21,110
dispatcher	22,206	8,050	24,321	110,767	87,680	8,058	8,979	59,876	6,065	15,685	21,502	72,443
franchise manager	22,206	8,050	24,321	110,767	87,680	8,058	8,979	59,876	6,065	15,685	21,502	72,443
lineman	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
line technician	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
office manager	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
production assistant	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
production director	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
project coordinator	22,206	8,050	24,321	110,767	87,680	8,058	8,979	59,876	6,065	15,685	21,502	72,443
sales manager	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
salesman	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
secretary	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
service technician	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
soundman	8,039	6,355	12,532	88,337	62,366	4,155	7,367	60,078	6,169	14,903	15,048	62,734
video technician	1,783	1,327	2,371	19,484	12,323	699	1,772	16,305	2,676	5,136	3,428	21,110

TABLE 3:12A (cont'd.)

NUMBER OF RESIDENTS WITH THE REQUIRED AMOUNT OF GED EDUCATION BY CITY - page 2

Cable TV Job Titles	Maryland	North Carolina						South Carolina	Tennessee		Virginia		
	Baltimore	Charlotte	Durham	Fayetteville	Greensboro	Raleigh	Winston-Salem	Columbia	Knoxville	Nashville	Norfolk	Petersburg	Richmond
bench repairman	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
cable installer	39,794	5,564	3,166	1,287	4,080	2,657	4,804	2,305	4,143	11,511	8,461	1,594	10,805
cameraman	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
chief technician	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
clerical/accounting	39,794	5,564	3,166	1,287	4,080	2,657	4,804	2,305	4,143	11,511	8,461	1,594	10,805
clerical/general	39,794	5,564	3,166	1,287	4,080	2,657	4,804	2,305	4,143	11,511	8,461	1,594	10,805
dispatcher	104,371	30,786	9,761	7,241	16,050	13,305	14,914	9,565	26,787	67,992	40,619	3,981	29,292
franchise manager	104,371	30,786	9,761	7,241	16,050	13,305	14,014	9,565	26,787	67,992	40,619	3,981	29,292
lineman	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
line technician	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
office manager	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
production assistant	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
production director	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
project coordinator	104,371	30,786	9,761	7,241	16,050	13,305	14,914	9,565	26,787	67,992	40,619	3,981	29,292
sales manager	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
salesman	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
secretary	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
service technician	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
soundman	119,152	30,041	10,248	5,300	16,743	11,955	15,995	10,596	17,519	47,256	35,301	3,882	34,793
video technician	39,794	5,564	3,166	1,287	4,080	2,657	4,804	2,305	4,143	11,511	8,461	1,594	10,805

SOURCE:

TABLE 3:12B

NUMBER OF BLACK RESIDENTS WITH REQUIRED AMOUNT OF GED EDUCATION BY CITY
(BLACK UNEMPLOYMENT BY CITY)

Cable TV Job Titles	Alabama		Arkansas	D.C.	Florida		Georgia				Louisiana	
	Huntsville (8.0%)	Tuscaloosa (6.0%)	Little Rock (6.7%)	Washington (4.2%	Jacksonville (6.1%)	Tallahassee (5.9%)	Albany (7.4%)	Atlanta (5.0%)	Augusta (6.6%)	Macon (6.2%)	Baton Rouge (8.3%)	New Orleans (8.4%)
bench repairman	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
cable installer	1,507	1,846	2,748	37,681	10,816	1,352	2,284	22,656	3,891	5,547	4,856	26,512
cameraman	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
chief technician	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
clerical/accounting	1,507	1,846	2,748	37,681	10,816	1,352	2,284	22,656	3,891	5,547	4,856	26,512
clerical/general	1,507	1,846	2,748	37,681	10,816	1,352	2,284	22,656	3,891	5,547	4,856	26,512
dispatcher	983	1,088	2,962	73,952	10,661	1,045	1,524	25,571	1,733	2,780	3,334	20,205
franchise manager	983	1,088	2,962	73,952	10,661	1,045	1,524	25,571	1,733	2,780	3,334	20,205
lineman	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
line technician	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
office manager	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
production assistant	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
production director	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
project coordinator	983	1,088	2,962	73,952	10,661	1,045	1,524	25,571	1,733	2,780	3,334	20,205
sales manager	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
salesman	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
secretary	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
service technician	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
soundman	1,567	1,971	3,944	71,946	13,764	1,493	2,326	29,365	2,480	4,591	4,201	30,088
video technician	1,507	1,846	2,748	37,681	10,816	1,352	2,284	22,656	3,891	5,547	4,856	26,512

TABLE 3:12B (cont'd.)

NUMBER OF BLACK RESIDENTS WITH REQUIRED AMOUNT OF GED EDUCATION BY CITY - page 2
(BLACK UNEMPLOYMENT BY CITY)

Cable TV Job Titles	Maryland	North Carolina					South Carolina		Tennessee		Virginia		
	Baltimore (6.3%)	Charlotte (4.8%)	Durham (4.8%)	Fayetteville (4.7%)	Greensboro (3.9%)	Raleigh (4.6%)	Winston-Salem (7.3%)	Columbia (5.0%)	Knoxville (7.0%)	Nashville (4.9%)	Norfolk (5.9%)	Petersburg (5.8%)	Richmond (4.2%)
bench repairman	54,180	8,345	3,578	1,947	4,320	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
cable installer	42,375	6,253	3,680	1,606	2,937	2,724	4,298	3,389	1,926	7,522	9,098	2,224	12,084
cameraman	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
chief technician	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
clerical/accounting	42,375	6,253	3,680	1,606	2,937	2,724	4,298	3,389	1,926	7,522	9,098	2,224	12,084
clerical/general	42,375	6,253	3,680	1,606	2,937	2,724	4,298	3,389	1,926	7,522	9,098	2,224	12,084
dispatcher	37,958	6,158	2,881	1,907	3,396	2,402	4,035	2,220	2,432	7,113	6,726	1,523	8,514
franchise manager	37,958	6,158	2,881	1,907	3,396	2,402	4,035	2,220	2,432	7,113	6,726	1,523	8,514
lineman	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
line technician	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
office manager	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
production assistant	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
production director	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
project coordinator	37,958	6,158	2,881	1,907	3,396	2,402	4,035	2,220	2,432	7,113	6,726	1,523	8,514
sales manager	54,180	8,345	3,578	1,947	4,302	2,402	4,795	3,331	2,557	9,949	10,514	2,122	14,662
salesman	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2.122	14,662
secretary	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
service technician	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
soundman	54,180	8,345	3,578	1,947	4,302	2,908	4,795	3,331	2,557	9,949	10,514	2,122	14,662
video technician	42,375	6,253	3,680	1,606	2,937	2,724	4,298	3,389	1,926	7,522	9,098	2,224	12.084

SOURCE:

And, while many of the jobs are technical and require apecialized training, for the Black Colleges this is an opportunity to function as a vital part of the economic decision-making of their city by taking on the responsibility of training minorities for these cable jobs. Manpower programs based at the Black Colleges could serve as vital conduits for minority workers seeking to upgrade their skill development as well as employ others who are currently not employed.

Acquiring Manpower Training Funds

One reason why the Black Colleges have been hesitant to apply for federal monies to do manpower training is the pervasive belief that a kind of grandfather clause exists in government funding (i.e., you have a better chance of getting funding if you have been getting funding). Another reason for their hesitancy is the fact that the Black Colleges do not have a strong track record in getting federal funds.

I suggest, at least from a legal perspective, that no such bias exists and one measure of the likelihood of the Black Colleges for funding can be derived by analyzing the numerical weight which various government agencies place on previous research experience in their funding decisions.

For example, an analysis of OMB approved guidelines for HUD show that only 10 points out of 100 can be given for previous university research capacity,

> "interest of university faculty in policy and problem oriented research."[19]

The only other time established research capacity is mentioned is in a question (worth a maximum of 16 points) which asks about the interest of university faculty in policy and problem oriented research, something which the Black Colleges would have no particular problem with. While funding decisions are ultimately political questions, on the surface, at least, the Black Colleges (many with minimal research portfolios) are still very much in the running for government money. In fact, the whole move toward general and special revenue-sharing may work in favor of the Black Colleges who tend by tradition and circumstances to be more local in their context as opposed to the nationally known schools who rely on strong Federal funding and Washington, D.C. rather than their state capitals for the great bulk of their research money.

Broadcasting has a special social responsibility, not quite like that of any other medium. This responsibility is implied in the Communications Act[20] and was originally borrowed from public utilities law.[21] The public interest, according to the FCC, is best fulfilled by local community self-expression and diversity in programming. These goals predate television insofar as they stem from the FCC which comes from the days of radio.

Cable television can insure both program diversity and local community self-expression. Diversity of program choice tends to fragment the audience, cause program costs to be spread across several different communities with the consequent effect that the program content be of a more generalized nature and, therefore, less community-oriented; hence, the tendency of broadcast network programming to be mass-biased.

APPENDIX 1

Definition of Cable Television System

Any facility that, in whole or in part, received directly or indirectly over the air, and amplifies or otherwise modifies the signals transmitting programs broadcast by one or more television or radio stations and distributes such signals by wire or cable to subscribing members of the public who pay for such service, but such term shall not include (1) any such facility that serves fewer than 50 subscribers, or (2) any such facility that services only the residents of one or more apartment dwellings under common ownership, control or management, and commercial establishments located on the premises of such an apartment house.

APPENDIX 2

HISTORICALLY BLACK FOUR-YEAR INSTITUTIONS

	INSTITUTION:	CONTROL:	ENROLLMENT:
1	Albany State College (Georgia)	Public	1,803
2	Alcorn A&M College (Mississippi)	Public	2,538
3	Atlanta University (Georgia)	Private	1,048
4	Barber-Scotia College (North Carolina)	Private	513
5	Benedict College (South Carolina)	Private	1,370
6	Bennett College (North Carolina)	Private	542
7	Bowie State College (Maryland)	Public	2,797
8	Clark College (Georgia)	Private	1,236
9	Coppin State College (Maryland)	Public	2,800
10	Daniel Payne College (Alabama)	Private	195
11	Dillard University (Louisiana)	Private	1,007
12	Edward Waters College (Florida)	Private	635
13	Elizabeth City State (North Carolina)	Public	1,109
14	Fayetteville State (North Carolina)	Public	1,643
15	Fisk University (Tennessee)	Private	1,556
16	Florida A&M University	Public	4,600
17	Florida Memorial College	Private	768
18	Fort Valley State (Georgia)	Public	2,081
19	Grambling College (Louisiana)	Public	3,823
20	Hampton Institute (Virginia)	Private	2,676

SOURCES: United Negro College Fund, 1973

Negro Almanac 1967

	INSTITUTION:	CONTROL:	ENROLLMENT:
21	Johnson C. Smith University (N. Carolina)	Private	1,043
22	Knoxville College (Tennessee)	Private	927
23	Livingston College (North Carolina)	Private	744
24	Meharry Medical College (Tennessee)	Private	531
25	Miles College (Alabama)	Private	1,056
26	Mississippi Valley State	Public	2,530
27	Morehouse College (Georgia)	Private	1,121
28	Morgan State College (Maryland)	Public	6,432
29	Morris Brown College (Georgia)	Private	1,462
30	Norfolk State College (Virginia)	Public	5,076
31	North Carolina A & T	Public	3,797
32	North Carolina Central University	Public	4,028
33	Oakwood College (Alabama)	Private	684
34	Paine College (Georgia)	Private	695
35	Philander Smith College (Arkansas)	Private	639
36	Rust College (Mississippi)	Private	714
37	St. Augustine's College (N. Carolina)	Private	4,028
38	St. Paul's College (Virginia)	Private	508
39	South Carolina State College	Public	2,640
40	Southern University (Baton Rouge, La.)	Public	9,728 (3 campuses)
41	Southern University (New Orleans, La.)		
42	Spelman College (Georgia)	Private	1,067

	INSTITUTION:	CONTROL:	ENROLLMENT:
43	Stillman College (Alabama)	Private	666
44	Talladega College (Alabama)	Private	496
45	Tennessee State University	Public	4,712
46	The Virginia College	Private	102
47	Tougaloo College (Mississippi)	Private	817
48	Virginia State	Public	3,699
49	Virginia Union University		
50	Winston-Salem University (North Carolina)	Public	1,720

Municipally Owned Cable Television

An important consideration for municipal finance officers

When the financial officers and other executives of a municipality consider the issuance of tax-exempt revenue bonds, it is usually in connection with water and sewer systems, toll facilities or other such workaday generators of income.

It is an entirely valid concept, already in use in municipalities, to issue tax-exempt revenue bonds to finance a municipally-owned cable television system. Such public ownership ordinarily nets more profit to the community than a franchise would. In addition, it enables the community to use the communications system for more public purposes than private ownership may permit.

A particularly important aspect of this type of financing is that it places no liability whatsoever on the municipality itself and does not affect in any way the municipality's ability to issue General Obligation Bonds.

Would you like to know more about this sound and innovative way to bring to your community the many benefits of revenue-producing CATV facilities? We have had wide experience in the field of municipal revenue finance and would be happy to place that experience at your disposal. Please get in touch with Herbert J. Sims, Chairman.

FOOTNOTES

1 One measure of the size of cable systems is the number of subscribers it services. Some systems have fewer than 100 subscribers. The largest (Cox Cable in San Diego) has about 75,000 subscribers. The average cable system has between 3,500 - 3,800 subscribers and systems with 10,000 or more subscribers are considered large by the industry. It should be noted that there are approximately 3.3 persons to a home and so a system of 10,000 paid subscribers represents over 30,000 people on an average. Systems over 15,000 subscribers are considered very large by the industry. There are 12 such systems currently in operation, 6 of which are in the South.

2 The Penguin Dictionary of Economics, Graham Bannock, R.E. Baxter and Ray Rees, 1972
Economies of scale exist when expansion of the scale of the productive capacity of a firm causes total production costs to increase less proportionately with output. As a result, long-run average costs of production fall. In this case, there exists internal economies of scale (indivisibilities) resulting from an overhead process. To produce a single program on videotape, the same scale of input is required regardless of the subsequent rate of output. This is true for the production of any reproducible media, eg., writing a book, making a film, typesetting a newspaper. Therefore, the more units produced, the lower the cost per unit of the overhead processes.

3 United Negro College Fund, 1973.

4 Dr. Thomas Sowell's references in Daedalus, Summer 1971, "The Future of Black Colleges."

5 BCN Phase II Final Report, Arthur D. Little, Inc., Nov. 1972.

6 Department of Commerce Records.

7 United Negro College Fund, 1973.

FOOTNOTES continued

8 One problem with price discrimination is that it is a less than perfect mechanism and may yield an indeterminate effect on allocation that could be worse than if a monopolist charged a single price.

9 Samuelson, P. A., "Public Goods and Subscription TV: Correction of the Record", Journal of Law and Economics (October 1964), p. 81

10 Definition of Ekistics: the study of the science of human settlements.

11 Price and Wicklein. Cable Television: A Guide for Citizen Action, Pilgrim Press, Philadelphia, p. 111.

12 Mason, William F.,Urban Cable Systems, The Mitre Corporation (1972), Washington D. C., pp. v-8.

13 Ibid. pp. v-27.

14 U. S. Department of Labor-Dictionary of Occupational Titles, 1965, Volume 1, Definitions of Titles, Third Edition, p. 449.

15 U. S. Department of Labor-Dictionary of Occupational Titles, 1965, Volume 2, Definitions of Titles, Third Edition, p. 187

16 U. S. Department of Labor-Dictionary of Occupational Titles, 1965, Volume 1, Definitions of Titles, Third Edition, p. 424.

17 U. S. Department of Labor -Dictionary of Occupational Titles, 1965, Volume 1, Definitions of Titles, Third Edition, p. XVIII, The Occupational Classification and Code.

18 Eckaus, Richard , Economic Criteria for Education and Training, Review of Economics and Statistics, Vol. 46, 1964, Harvard University, Cambridge, Mass.

19 HUD Urban Observatory Program 1975 Guidelines.

20 FCC, Public Service Responsibility of Broadcast Licensees (1046), p. 12.

21 Communications Act of 1934, Section 303 (h), 303 (s), and Section 307 (b).